

The Iron Age

A Review of the Hardware and Metal Trades.

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Improvement in Elevator Hoisting Machines.

The accompanying illustration represents the elevator exhibited at the Centennial by Messrs. Volney W. Mason & Co., of Providence, R. I. It shows the whole elevator complete, with safety apparatus and wire rope for hoisting and shipping, and all connections precisely as in regular work. The exhibit is without useless ornamentation, and is intended to show exactly the style of workmanship turned out from the shop. The machine is suspended over head, bolted by four bolts to a hard pine frame, and is open for inspection from all sides. The shipping apparatus is conveniently arranged so as to enable it to be worked as in actual use. The platform is one of several built for the American Screw Company, of Providence, and has an iron-clad floor to enable it to stand unusually hard service. The uprights or sides of the platform are of iron, which, beside being stronger, economize space much better than could be done with wood. The corner brackets which hold the safety levers are extra heavy and strong, and all of the details have been carefully worked out by the designer. The rope fasteners upon both drum and platform are of a new kind. The rope is clamped between two grooved disks by bolts, in such a manner as to effectually secure the rope against giving way. At the same time the strength is not at all impaired by the fastening, and the rope can be easily removed whenever wear renders it necessary. The brackets supporting the wheels or sheaves, around which the shipper rope passes at the top and bottom of the elevator shaft, are slotted to admit of adjustment, or take up of slack in the wire shipper rope. It will be noticed that there is no shifting of belts in this machine. This effects a very large saving in the wear of belts, which run much longer and much more satisfactorily than when they are constantly shifted from one pulley to another, as is unavoidable where fast and loose pulleys are employed. This friction clutch used by the firm is not only much neater, but the stopping and starting of the platform are more prompt, and the wear of rubbing surfaces takes place at points where it is easily provided for and can do no harm. The position of the driving pulleys at either end of the shaft equalizes the draught of the belts better than any other, and permits the oiling of the pulleys to be done through the center of the shaft when in motion. As the oil is always thrown outward in quick running pulleys, sometimes to such an extent as to leave one of the ordinary bearings dry when running fast, this is an important improvement. The motion by which the shipping and unshipping is accomplished is that of the crank, and is so arranged that the maximum power of the crank is obtained at the moment when the most resistance is to be overcome. It follows that the power required for moving the shipping rope is equalized. The crank, being on a dead center when the elevator is running in either direction, prevents the possibility of an accidental unshipping by the slipping of the crank and a loosening of the friction clutch. All the parts of this hoisting apparatus are contained by the frame, which makes it more easily put up or taken down, and holds the parts more rigidly in place than in machines not thus constructed. At the same time, this arrangement prevents parts from getting out of line or displaced in any way. A machine with many detached parts oftentimes requiring as much time to set it up as was needed to build it in the machine shop. By the system of uniformity and interchangeability of parts, these elevators are made at a very low price, and can be furnished at short notice. The firm also make machinery furnished with these friction clutches for various kinds of power hoisting in different localities, as pork packing houses, abattoirs, copper and coal mines, quarries, etc., for which estimates are furnished.

American Institute of Mining Engineers.

The following are abstracts of papers read at the June meeting of the American Institute of Mining Engineers, at Philadelphia.

THE COMPOSITION OF FLUE DEPOSIT.*

During the last three or four years I have had occasion to examine chemically various samples of matter commonly called flue dust or cinder, found deposited in the flues and hot blast chambers and under the boilers of blast furnaces, and also in the flues and under the boilers of puddling and rolling furnaces.

Recently several of these examinations were made quite in detail, and as the results reveal, I believe, information of no inconsiderable importance, I am induced to communicate them to this Institute.

A sample of deposit obtained from the flues of one of the blast furnaces at the works of the Phoenix Iron Company, at Phoenixville, Pa., was found to be composed of

Protoxide of Iron.....	1.51
Peroxide of Iron.....	30.21
Alumina.....	6.57
Lime.....	3.98
Magnesia.....	.69
Protoxide of Manganese.....	1.66
Oxide of Zinc.....	2.84
Oxide of Copper.....	.95
Silicic Acid.....	86.00
Sulphuric Acid.....	7.55
Phosphoric Acid.....	.94
Arsenious Acid.....	.35
Antimonious Acid.....	trace
Chlorine.....	.08
Cyanogen.....	.09
Ammonia.....	trace
Potash with some Soda.....	16.61
Carbonic Acid.....	.29
Undetected matter and loss.....	.79
	100.00

Metallic Iron, 15.31
Phosphorus, .41—2.67 of phosphorus to 100 of iron.

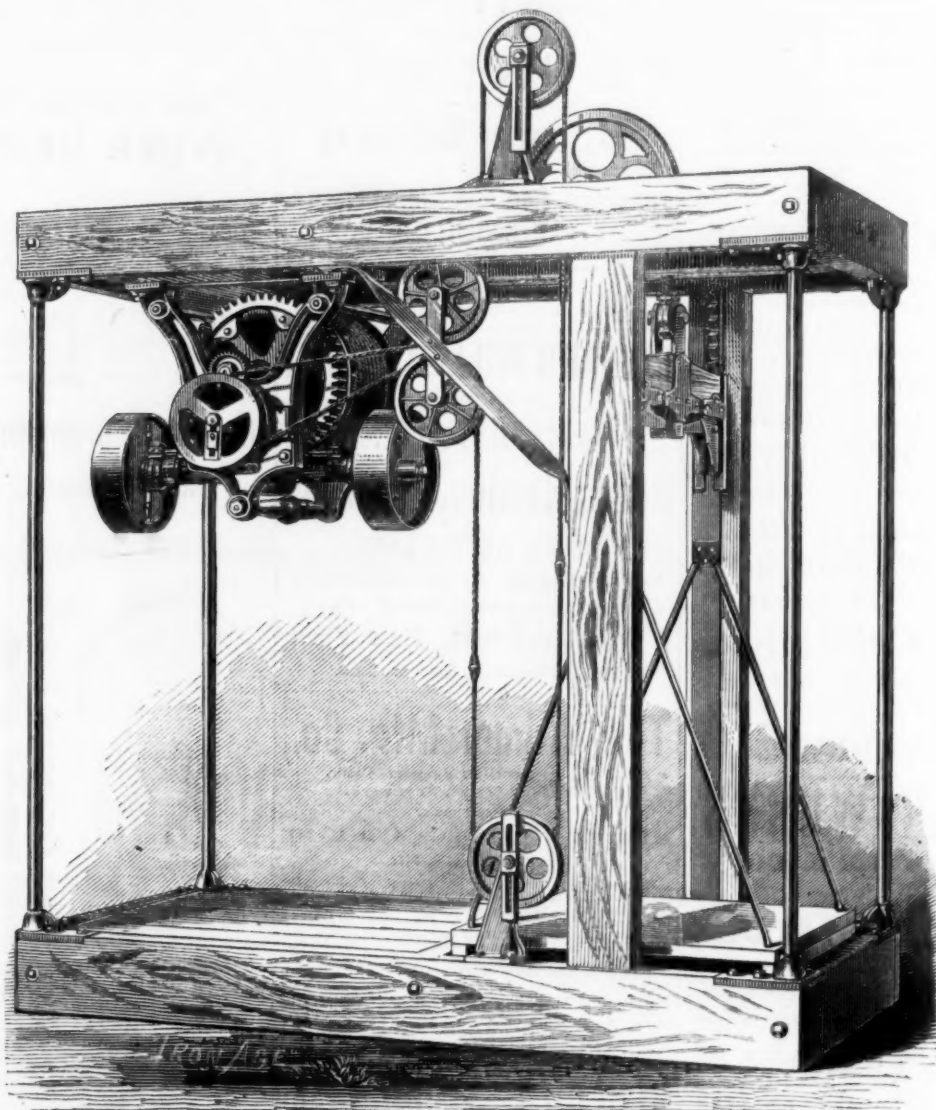
Nickel, cobalt, chromium, titanium, bismuth, lead, barium, fluorine and several other substances were also specially searched for, but not a trace of either of them could be found. The ores used were, I was informed, magnetic and brown hematite mixed. The fuel was

These remarks have reference only to the flue deposit from anthracite furnaces. I have no personal experience in the examination of that from coke or charcoal blast furnaces. I should infer, however, that anthracite and coke furnaces afford deposit of corresponding composition, while charcoal furnaces afford the material relatively richer in potash and poorer in sulphuric acid.

A sample taken from the flues of a puddling furnace yielded upon analysis as follows:

Protoxide of iron.....	3.08
Peroxide of iron.....	33.29
Silica.....	40.69
Alumina.....	12.89
Lime.....	.48
Magnesia.....	.09
Protoxide of manganese.....	.39
Sulphuric acid.....	1.05
Phosphoric acid.....	3.55
Alkalies, undetermined matter and loss.....	4.99
	100.00

Metallic iron, .95-70.
Phosphorus, .155—6.03 of phosphorus to 100 of iron.



IMPROVED ELEVATOR HOIST.

Schuylkill anthracite, and the flux was the ordinary limestone of the neighborhood.

A sample of similar deposit obtained from one of the furnaces belonging to the Crane Iron Company, on the Lehigh, afforded of soluble salts of the alkalies nearly 30 per cent. There was detected in it cyanogen, and also chlorine, and a very appreciable amount of carbonic acid, but not a trace of ammonia. A full examination was not made, and only the iron and phosphorus were quantitatively determined. Of the former there was 8.20, and of the latter, 27, equal to 3.29 of phosphorus to 100 of iron.

Another sample from the hot-blast chamber of a furnace on the Hudson, belonging to the West Point Iron Company, proved exceedingly complex in composition. It afforded 18.67 of potash, 9.81 of sulphur, or 24.52 of sulphuric acid, but only 5.47 of metallic iron, with .34 of phosphorus, equal to 6.22 of phosphorus to 100 of iron.

These two furnaces used anthracite from the Lehigh region, mixed magnetic and brown hematite ores, and limestone from their respective neighborhoods.

In other samples of the materials taken from the flues of different furnaces, I have found from about 4 to more than 30 per cent. of the alkalies. Upon searching for phosphoric acid I never failed to find it. Sulphuric acid I also found constantly present, and usually in notable quantity.

The material was always, to a large extent, soluble in boiling water, sometimes more than 60 per cent. dissolved. It was invariably readily fusible in the flame of the blow pipe.

Another sample of deposit taken from the flues of a boiling furnace yielded:

Protoxide of iron.....	1.18
Peroxide of iron.....	41.90
Silica.....	38.99
Alumina.....	7.54
Lime.....	.61
Magnesia.....	.19
Protoxide of manganese.....	.19
Sulphuric acid.....	.12
Phosphoric acid.....	2.98
Alkalies, undetermined matter and loss.....	6.96
	100.00

Metallic iron, .29-64.
Phosphorus, .130—4.72 of phosphorus to 100 of iron.

The two last samples were received from the works of the Phoenix Iron Company. The iron worked in the furnaces was known to be phosphoric. The fuel used was bituminous coal.

The results quoted would seem to show pretty clearly that more or less phosphorus is volatilized from iron during the processes of smelting, puddling and rolling. They beyond question show that the substance is carried with the dust and fumes from the furnaces into the flues and chambers, and, as it is known that limestones and coals usually contain very little of it, it may be assumed that much the larger portion of what was found in the deposited matter came from the ores and metal. That all that passed up from the furnaces becomes deposited in the flues and chambers cannot be supposed. It is more than probable that no inconsiderable amount escaped along with the associate matter, entirely through the works into the open air. The results so far obtained, therefore, could be of no value in determining the total per cent. volatilized, even from all the material in the furnaces, though the weights of

that material, as well as the weight of the flue deposit, were known.

But these results present another matter of no less importance for consideration. They show that there is expelled from the blast furnace a very large amount of alkali. Sixteen, 18 and even more than 30 per cent. of the gross flue deposit proved to be potash and soda. The question at once arises, From what source or sources did they come? We know that nearly all iron ores contain a little, but usually not enough for the careful analyst to quantitatively determine, and the same may be said with still more emphasis of the limestones; we then must look to the fuel as having been the chief source. It has not, I believe, heretofore been shown by the analyses of anthracites that any of them are rich in alkali; indeed, mostly just the contrary has been shown, but this may have been due to defect in the method of analysis. Search has been confined to the ash only, and not extended to the raw coal or

loss was 1.24. The same portions were then placed in a hot-air oven, and for two hours kept at a temperature of 285° F., and after cooling in a dry chamber were again weighed, when there was found a further average loss of 1.22, making a total so far of 2.46. They were then immediately returned to the oven, and for two hours more kept at a temperature of 530° F., and cooled and weighed again, when no further loss was found, but an average gain of .55 upon the previous weighing. The same portions were a third time placed in the oven, and for about ten minutes kept at the last temperature, and then, while still hot, were poured into one-quarter inch glass tubes, each with a bulb at one end, and tested over a Bunsen burner at a temperature below a red heat, when more water vaporized and condensed in small, clear globules at the cold parts of the tubes.

Fresh portions of the coals were then taken and the total amount of water determined, and the average was found to be 3.04, or 1.80 more than was found at the temperature of the water bath, which was, perhaps, a little below 212° F., and .58 more than at 285° F.

Tests were afterward made by placing other fresh portions of the coals within a bell glass over strong sulphuric acid, and retaining them there for more than 36 hours, when the total average loss was found to be 1.91 or 1.13 below the amount of water actually present in the coals. Upon allowing some of these last portions to remain in the open air for a couple of hours, they were found to have nearly regained their original weights. Additional fresh portions were then weighed and left exposed to the open air of the laboratory; the next day they were weighed again and found to have gained an average of 1.03. This gain proved to be due almost entirely to moisture absorbed.

A sample of bituminous coal from Clearfield county, Pa., was treated very nearly in the same manner. Dried on the water bath for one hour, it lost 1.69; dried in the hot-air oven for one hour at 250° F., the loss was less, being 1.65; and for another hour at 280° F. the loss remained nearly the same, 1.66. Being a third time returned to the oven and kept for about two hours at 580° F., the loss was increased to 2.14. The coal was then tested in a bulb tube over a Bunsen burner at below a red heat, and the presence of water was distinctly detected. The actual amount of water in the sample was subsequently found to be 2.46 or .77 more than the loss at the temperature of the water bath, and .32 more than at the temperature of 580° F.

Another sample of bituminous coal from Huntingdon county, Pa., upon drying on the water bath for one hour, lost in weight .76, and after being kept in the oven for two hours at 545° F., the loss was reduced to .35; upon then being tested in a bulb tube over a Bunsen burner, water was detected. The total amount of water found in this sample was 2.02, or 1.26 more than the loss at the temperature of the bath.

A sample of gas coal from West Virginia gave similar results. Another sample of the same kind of coal from the Kanawha River, upon exposure in the oven for one hour, at about 560° F., was found not to have lost, but to have gained nearly 1 per cent. over its normal weight, and then when tested in the bulb tube over a Bunsen burner, gave off a very appreciable amount of water.

Quite a number of analyses were made of the true brown coals, or lignites, of Southern Arkansas, to ascertain their value for the production of paraffine, and it was found that they did not part with all of their water, which amounted to an average of about 19 per cent., until destructive distillation commenced. A portion of a sample of coal from east of the Rocky Mountains, on the line of the Union Pacific Railroad, was placed in a hot-air oven, and for an hour and a half kept at a temperature of 170° F., when it was found to have lost in weight 5.72; kept for one hour more at a temperature of 280° F., the loss was increased to 7.31, and again for two hours more at the same temperature, the whole loss was found to be 7.55. Another portion of the same sample was then subjected for three hours to a temperature of 500° F., when the loss was further increased to 9.55. The watery vapor from this last portion was condensed in a cold glass tube, the tube was carefully weighed, and then the water cautiously evaporated. Afterward the tube was weighed again, and from the loss the weight of water was ascertained. The coal was then weighed, and its loss was found to correspond very nearly with the weight of water. Upon immediately testing it in a bulb tube over a Bunsen burner more water passed off; and upon continuing it over the burner at a higher temperature, white fumes and a dark brown oil passed off, but no more water. The actual amount of water in this sample was subsequently found to be 12.50.

I have made many other experiments, the results of which I need not give in detail; collectively they have tended to prove:

1st. That water exists in the several classes of coal in two conditions, i. e., combined and uncombined, but in these conditions not constant in relative proportion.

2d. That some coals will and some will not, irrespective of the class to which they belong, when finely pulverized and left open to the air gain in weight by taking oxygen, while at the same time they lose in weight by losing water and hydrocarbons, at temperatures varying between that of boiling water and one that is sufficient for destructive distillation.

3d. That all coals when deprived by heat of any portion of their normal water will, upon exposure to the open air at common temperature, immediately begin to regain their loss. It therefore follows that correct weighing cannot be done with the material unaltered.

4th. That the method of determining the water by merely finding the loss which the coal sustains by drying for one hour at 212° F., or for any length of time or at any temperature, whether over sulphuric acid or not, gives fallacious results.

WATER IN COALS.*

Six different samples of anthracite, each a firm, compact lump, were finely pulverized and immediately put in bottles. Portions of these were weighed and placed upon an ordinary water bath and dried for one hour; the average

* Read before the American Institute of Mining Engineers, by J. Blodget Britton, June 26, 1876.

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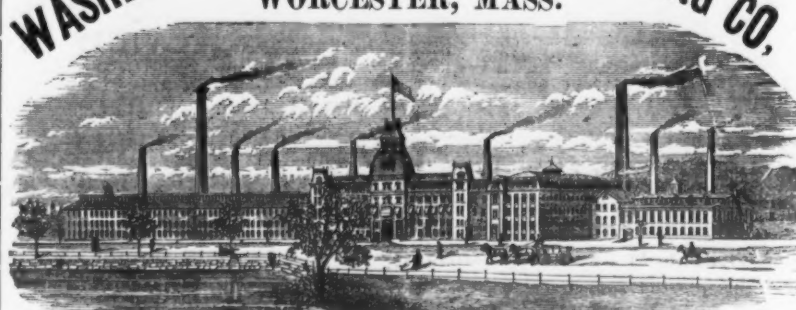
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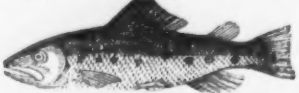
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503 Commerce Street, PHILADELPHIA.
Manufacturers of
**FISHING TACKLE, CHALK & FISHING
LINES, FISH RODS, FISHES, LEAD-
ERS, RODS, REELS, &c.**
A specialty of celebrated Green Heart Wood and Fine
Brass and German Silver Rod Mountings. Our prize
medal Kent and Gled and Green Heart Trout and Bass
Fly Rods are the best in the world.
Sole Agents for John James & Sons' Fish Hooks,
Needles, &c.
Price Lists to the Trade only on application.



**Patent Waterproof
FISHING LINES and NETS**

Under the New Patented Process.
This preparation will not wear off, soak out, or
wash out. Resists the destructive action of the at-
mosphere. Repels water. Increases the strength of
the fabric and the colors are made fast. Water-
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Durable. All communications to be addressed to
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TIN LINED IRON PIPE.

A pure **BLACK TIN PIPE** within a wrought
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and Cheapness.

TATHAM & BROTHERS,
82 Beekman Street, N. Y.

Verona Tool Works.

METCALF, PAUL & CO.,
Pittsburgh, Pa.
Sledges, Hammers,
AND SMITHS' TOOLS,
AND THE STANDARD
Verona Solid Eye Picks.
All warranted the Best Solid Cast Steel.

EDWARD SWEENEY, Brass Founder,

Manufacturer of
GONG BELLS.
Steamboat and Locomotive Gongs kept on hand. A
liberal discount to the trade. Bell Hanging and Jobbing
done to order.
4 DUANE STREET, N. Y.

**REDUCTION.
Manila Pails**

REDUCED TO \$7.50 PER DOZ.
These goods we warrant not
to be affected by climate, or
water, hot or cold.
Are Durable, Light, Strong
and Tasteless, have no
hoops, and will not absorb
their contents. Orders from the
trade solicited.
For circulars and terms, ad-
dress,
W. F. HYATT,
Manufacturers' Agent,
280 PEARL ST., - NEW YORK.

**THE
Gilbert & Bennett Mfg. Co.,**
GEORGETOWN, CONN.,
MANUFACTURERS OF

**Iron Wire, Curled Hair
AND GLUE.**



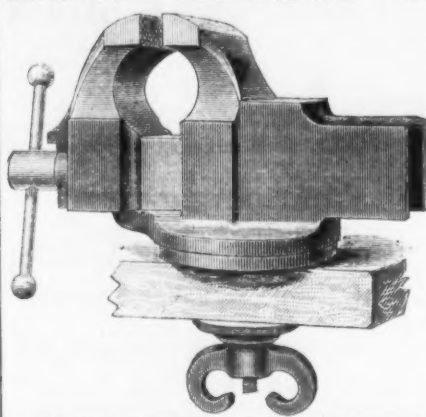
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**UNION METALLIC CLOTHES LINE
WIRE.**
The highest price paid for Cattle's Tails and Hog's Hair
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**BEST IN THE WORLD.
Blatchley's Horizontal
ICE CREAM FREEZER**

(Tingler's Patent)
For Saloons, Hotels, Fam-
ilies or Ice Cream Manu-
facturers, in the economy and
perfection of its work, is en-
tirely unequalled. The
closed head will save ice
enough in one season to pay
for the machine. The tub
requires only one filling to
freeze. Size, 3 to 4 quarts.
Cool, Out and Hair Sieves,
Hair and Wire Gravy Sieves,
Brass and Iron Riddles,
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Cool Hoods and Shelves,
Sieve Scrapers and Pickers.

Visitors are cordially invited, when in town to the Big
Exhibition, to come and see us, or send for descrip-
tive circular and price list. Very liberal arrange-
ments made with the trade. The machines can also be seen at
the Centennial Exhibition, Agricultural Hall, Cor.
Aisles 9 and 10, Column letter O, No. 10.
C. G. BLATCHLEY, Manuf., 58 Commerce St., Phila.

New Model Swivel Vise.



The advantage claimed for this Vise over the
ordinary patterns is in the ease with which it is
adjusted to whatever angle may be required.

**Trenton Vise & Tool
Works,**

MANUFACTURERS OF
**Solid Box Vises, Hammers, Sledges,
Picks, Mattocks, Grub Hoes, &c.**
Warehouse,
101 & 103 Duane St., NEW YORK.
HERMANN HOKER & CO.

The Faultless Fruit Can.



PATENTED.
The perfection of this article, in all of the essential points of a good
fruit preserver, has been thoroughly demonstrated by the immense num-
ber sold. The demand increases, but with largely increased facilities we
shall be able to meet the wants of the trade. As the can tapers slightly
when made up, they nest together, thus saving space greatly. The
opening is the full size of the top of the can, admitting of perfect clean-
ing and drying; and so making them much more durable.
When not in use for Fruit they make a very nice receptacle for Tea,
Coffee, Spices, etc., the close fitting cover making it air-tight.
Another important feature is the labeling device, whereby the con-
tents of the can, date, and method of preserving are easily shown.
We furnish the complete trimmings for the FAULTLESS CAN,
including the body all ready for soldering, at the following very low prices,
viz.:
\$9.50, 1 qt.; \$10.50, 1 1/2 qts.; \$12.50, 2 qts. per gross.
Cans made up ready for use:
\$9.75, 1 qt.; \$10.75, 1 1/2 qts.; \$12.75, 2 qts. per gross.
We would caution dealers against an imitation of our can having a
"swell" or "dead" near the top to prevent the cans sticking together when
nested, as this feature is covered by our Patent.
The Trade only supplied.
Use good Sealing Wax for this, and all other cans, to secure good
results.

F. STURGES & CO., Sole Manufacturers,
72, 74 & 76 Lake Street, CHICAGO.



SCHIERLOH MFG. COMPANY,

Sole Manufacturers of
Cherry Heat Welding Compound.
OFFICE, 24 Exchange Place, Jersey City, N. J.
This compound is put up and warranted genuine only in 1, 5, 10, 50 and 100 lb.
packages, and can be obtained from the manufacturers direct, or from the following
General Agents at manufacturers' prices, in large or small quantities:
WHITMORE, WOLFF, LANE & CO., Pittsburgh, Pa.
PARKHURST & WILKINSON, Chicago, Ill.
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H. R. IVES & CO., Montreal, Prov. of Quebec.
It is also for sale in 1, 5 and 10 lb. packages by Hardware Dealers generally through-
out the country.



O. LINDEMANN & CO.,
Manufacturers of
**JAPANNED AND PATENT BRIGHT METAL
Bird Cages.**
Received the
FIRST MEDAL
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World's Exposition of Vienna,
1873
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No. 254 Pearl Street
Factory,
Nos. 252, 254 & 256 Pearl Street,
NEW YORK.
Importers of GERMAN TEA TRAYS in
four colors. Catalogues and Price Lists
furnished to the Trade only.



BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of **Shank, Socket Firmer, and Socket Framing
Chisels.**
PLANE IRONS.
Gauges of all lengths, and circles beveled inside or outside. Nail Sets. Scratch and Belt Awls, Chisel
Handles of all kinds. Orders filled promptly; generally same day as received.

Turbines at the Centennial.

Turbine water wheels are represented in very
great variety in Machinery Hall, and persons
inspecting them in detail would be puzzled
to decide as to which of the number is the
best.

Since the first successful application of the
principle by M. Fourneyron, of France, in 1827,
the subject has commanded much well merited
attention. To U. A. Boyden, of Massachusetts,
belongs the honor of perfecting the invention
and establishing the theory of the mathemat-
ical principles involved in its construction and
adaptation to the different circumstances in-
cident to the use of water-power, such as high or
low fall of water, volume, velocity, &c.

As a proof of the correctness of these theo-
ries may be cited the fact that in the working
tests some of Mr. Boyden's wheels, even at
that early stage, developed from 80 to 88 per
cent. of the actual power of the water used.
These results have never been surpassed, even
by the latest and most improved forms of tur-
bines. Mr. Boyden's career as a water-power
engineer closely resembles that of James Watt
in connection with the subject of steam-power.
In fact, the analogy is perfect. Watt, al-
though not the original inventor of the steam
engine, was the first to make a successful ap-
plication of the principle to the actual perfor-
mance of work on a practical scale, and in some
respects his original views are followed to the
present time. This was exactly the case in
regard to Mr. Boyden, and to this day his theo-
ries of turbines are accepted as correct.

The great money interests involved in the use
of water-power in America, particularly in our
Western States, have induced manufacturers
to devote a large amount of time and ingenuity
to the subject, and the result is that there are
almost as many and as different forms of tur-
bines as there are of steam engines. Many of
the wheels exhibited show a radical change (in
the admission of water and other points)
from what was originally considered absolutely
essential.

As it would prove an almost interminable
task to describe in detail all the modifications,
a brief mention of a few of them, selected in-
discriminately, will suffice.

THE BOLLINGER TURBINE,
manufactured by the York Mfg. Co., of York,
Pa., takes water on the outside, or periphery, of
the wheel, and discharges toward the center.
This feature is directly opposed to the original
method, which was to admit the water at the
center of the wheel and discharge at the
periphery. The curvature of the blades and the
construction of the gates, or valves, is such
that the water strikes on a tangent, the direc-
tion by which its greatest power is obtained.

This, however, is the point aimed at in all
wheels, and is assimilated more or less closely
in each. One of the best features of this wheel is
the construction of the gates or valves. They
are ten in number, and close independently by
the pressure of the water. The opening is ef-
fected by a cam-ring having an inside toothed
segment, and by a pinion, on the shaft of which
is a universal joint which enables it to be led in
any convenient direction for easy access in stop-
ping and starting. The great advantage claimed
for the independent gates, is that in case of a
stick or other obstruction catching in one of
them, the others will close, and enable the
wheel to be stopped.

HUNT'S DOUBLE-ACTING TURBINE.
The principal or most important claim for
this wheel is the gate, although there are some
other very creditable points in its construction.
The gate is circular and works between the
guides and the wheel. Attached to this gate
are four rods having yokes and racks, and
worked by a pinion shaft. As the gate ring is
turned inside and out, on the lower edge it is
water-tight, and not liable to be disabled by ob-
structions. The power required to open or close
it is very slight, as there is no unbalanced pres-
sure of water against it, except at the first in-
stant of opening, when the water entering acts
on all sides alike—the weight of the ring and
attachments, with a slight percentage of fric-
tion are the only resistance to be overcome.
As it is capable of being operated very quickly,
in case of accident making a sudden stoppage
necessary, this feature is of the utmost impor-
tance.

The construction of the guides is peculiar, be-
ing perpendicular on the receding side and nar-
rowing from top to bottom on the other.
These curves are all calculated with great care
and precision, and are claimed to supply water
to the wheel with either full or fractional gate
(particularly the latter) with the direction and
volume which will give the best results.

The wheel proper has an unusually deep
face, the buckets being constructed to hold
water so long as it retains any motive power,
and by this means a much smaller diameter of
wheel than is ordinarily used for a rated power
may be used.

The machine is strong and well built, and, as
actual contact of surfaces on the working parts
is avoided wherever possible, it is very durable.

GEO. A. HOUSTON'S TURBINE.
In this wheel the water enters through
numerous gates of peculiar construction, placed
at an angle of 45° with the face of the wheel,
and thus forms a connecting link between the
two distinct classes of wheels, viz., those
taking water on top and discharging directly
downward, and those receiving it on the face or
periphery and discharging toward the center.
The Houston wheel, by taking the above angle,
partakes equally of the nature of both.

The general shape of the gate is that of a
truncated cone having a facial angle of 45°, and
it is composed of a top and bottom ring, and
the connecting webs which are curved to cor-
respond with the guides, thus partially estab-
lishing the direction of the current even before
the water reaches the latter. There is a quick
curve or lip at the top, which is to prevent in-
terference between the different currents.

The great number of openings in the gate in-
sure a uniform distribution of water, and also
renders but slight motion necessary in opening
or closing, which is effected by means of a
worm gear—thus giving great power, and en-
abling the gate to be closed against any ob-
structions which will not actually break the
gate or guides. The step and journal bearings
are adjustable—the latter being in three sec-
tions, which may be set up, or replaced when
worn, independently.

All wheels smaller than 30 inches diameter
are supplied with a draft tube, while the larger
sizes are furnished with a bridge tree. In con-
struction these wheels combine all requisites
of material, workmanship, etc., necessary in a
first class wheel. They are manufactured by
Fales, Jenks & Sons, of Pawtucket, R. I.

The exhibit comprises several other features
of interest beside the wheel described, and
may be seen in Hydraulic Annex, Machinery
Hall.

THE NATIONAL TURBINE,
manufactured by the National Water Wheel
Company, of Bristol, Conn. The exhibit of
this company is in space D. 10, col. 77, Machin-
ery Hall. The gate of this wheel has openings
which are equidistant, and four in number.
These are again subdivided into four independ-
ent fractional openings, each of which has its
own lines of curvature, and insure the proper
direction of admission of water to the wheel, and
prevent cross currents. The gate is composed
of the top and bottom rings, connected by
four webs which are of the same width as the
openings, between (one-eighth of the circum-
ference of a circle). It is supported by a spider
which is revolved on a collar bearing on the
top of the dome, by means of a pinion and seg-
ment gear; the travel being limited to 45°, this
preventing it from opening backward by being
turned too far. When the wheel is not in
operation these webs completely cover the
openings. When running it may be set to any
or all of the fractional openings according to
the power required. This arrangement of the
fractional gate constitutes the principal fea-
ture of the superiority claimed for the wheel,
and for the following reason: Take, for in-
stance, the wheel running on one-fourth gate—
the water is admitted through but one division
of each of the four openings, and is held to-
gether until coming in contact with the buckets
of the wheel. It is obvious that by being thus
concentrated the impact is much greater than
if the water were allowed to spread and fill the
whole gate before striking the buckets, and
the percentage of power developed by the one-
fourth opening is as great as that of the full
gate.

Another great advantage is that from the
construction of the guides or openings and the
gate, shear edges are formed which will readily
chip off any ordinary obstructions (such as
sticks, grass, etc.) which may be drawn into the
openings, and might under other circumstances
prevent the stoppage of the wheel.

The wheel is well made and of the best ma-
terials, and may be seen at the above space ex-
actly as manufactured for sale, those exhibited
having been taken from the warehouse and not
built expressly for show.

(To be continued.)

Fac-Simile Tel-ography.

Mr. W. E. Sawyer has, we are informed, per-
fected an apparatus for transmitting telegrams
in such a manner that the printing apparatus at
the receiving office shall record the message in
a fac-simile of the sender's hand.

The system is capable of transmitting over a
single wire from 50 to 150 words per minute,
against a possible 30 to 40 by the Morse system,
which is that now in common use. But by this
system a person's own handwriting is trans-
mitted by telegraph, the same as though sent
by mail, and, in brief, simply accomplishes let-
ter writing by telegraph. In order to render
its operation fully understood, it may be de-
scribed as follows:

First, the sender of a message writes it upon
ordinary white paper; the written message is
then laid upon a metallic plate and passed be-
tween two rollers, with the effect of transfer-
ring the copy to the plate, which may be done
any time within 10 hours after writing. Then
the plate containing the copy is placed upon a
semi-cylindrical holder which traverses a little
track, and the instrument is set in motion, the
whole operation up to this point having been
accomplished in less time than it takes to write
it; whereas, by the Morse system, quite a num-
ber of minutes elapse before the message
reaches the operator. The metallic plate is a
conductor of electricity, while the lines of
writing are non-conductors. Over the cylin-
drical plate are carried metallic points upon
revolving arms; whenever the point is upon the
metallic surface, the electric current passes
through to the wire; the instant the point
touches a line of writing, the connection is
broken and a dot is made upon chemically pre-
pared paper, placed upon a similar instrument
at the receiving point.

The two instruments operate synchronously,
i. e., the moment a point is passing over the
surface of one instrument, it is followed exactly
by the point on the other instrument. An in-
genious mechanical arrangement perfects the
transmitting powers and prevents the possi-
bility of one instrument gaining over the other.
At the same time the points are moving over
its surface, the plate is moved slowly horizon-
tally, so that the entire surface is traversed.
The transferred message is, of course, in re-
verse, but is brought straight by running the
receiving instrument in an opposite direction.
Each instrument is fitted to either receive or
transmit, at pleasure. The rate of speed varies
according to the closeness of the writing; the
points traversing the entire surface of the copy,
it is immaterial as to the number of words, only
the space they occupy requiring a given time
to be gone over. Ordinary writing will be
transmitted at the rate of from 50 to 100 words
per minute.

The message, as received, is ready at once for
delivery, and appears in close, dark blue dotted
lines, on white paper. There is no loss of time
in counting words at the sending station, as is
now the case, nor delay in getting to the hand
of the operator; but, in a quarter of a minute's
time from its being received, it is silently speed-
ing its way to its destination, and automatically
preparing itself for delivery. The wonderful
facilities of the system render it peculiarly
adapted to a large and hurried business. It is
the fruit of many years' close application,
hence the perfection with which it makes its
appearance.

The writer of a message is, of course, as
usual, supplied with blanks. In the system
proposed—and which is now being perfected
by the company already formed to utilize the
invention—for whatever may be written upon
the blank he will pay an invariable sum of
money, if under 250 miles; if over, double that
amount, in stamps to be furnished by the com-
pany, and used the same as postage stamps.
Whatever is written upon the blank, whether 5
words or 50, will be sent for the same amount.
It is so much blank passing through the instru-
ments, and no cognizance is taken of its con-
tents.

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Successors to GAM'L G. SMITH & CO.,
IRON WAREHOUSE,
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Angle and T Iron.
PIG IRON, OLD RAILS,
Wrought Iron Brams. Iron of all sizes and shapes
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All sizes and shapes in stock.

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Refined Iron,

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Common Iron.

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Sheet Iron.

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48, 50 & 52 Thomas, and

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Used in the Construction of

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Manufacture the Patent C. fragnated Iron Shingles,

making the most durable roof in the market, not

affected by contraction or expansion, which causes

slored tin roofs to leak. Price only \$6.50 per square,

painted on both sides, packed ready for shipping.

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AND

Borden Mining Company's

Cumberland Coals.

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way Iron, Cast Spring, Toe Calk, and
Hessener Steel Tire.
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Hamilton, McWhorter & Bruen Sts.,

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the largest of their class in the United States, and
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Their location, coupled with every known im-
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enable them to offer Rails, when quality is con-
sidered, at lowest market rates.
The long experience of the present Managers,
of the Company, and the enviable reputation
they have established for "CAMBRIA RAILS,"
are deemed a sufficient guarantee that purchasers can,
at all times depend upon receiving rails unsurpassed
for strength and wear by any others of American or
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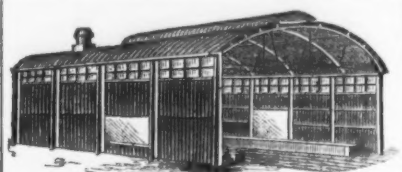
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PATENT
Planished Sheet Iron.

Patented March 14th, 1866; April 8th, 1873;
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the

IMPORTED RUSSIA IRON,
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METAL DEALERS

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The superior quality and cheapness of the produc-
tion of my **PATENT FRUIT CAN TRIM-**
MINGS (Patented April 6, 1875), having induced
certain parties to infringe my patent, I have com-
pelled them to cease manufacturing, and I will pro-
ceed against any one who may infringe in the future.

The Very Best
FRUIT CAN TRIMMINGS,
(3 1-2 Inch Opening.)

Are manufactured under process patented April 6,
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WOODBURY, N. J.

I am making arrangements to the end that at least
one prominent house in all the principal cities of the
United States will keep a supply of my trimmings,
for the trade.

J. M. PATTERSON,
Sole Manufacturer,
WOODBURY, N. J.

Samples furnished free upon application ac-
companied by business card.

New Patents.

We take from the records of the Patent Office
at Washington the following specifications of
certain patents, lately issued, which will be
found interesting:

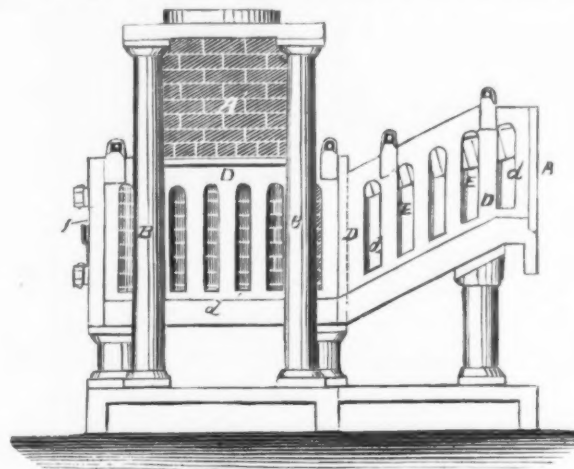
IMPROVEMENT IN CONSTRUCTION OF NECKS OF
PUDDLING FURNACES.

Specification forming part of Letters Patent
No. 176,410, dated April 18, 1876, issued to
Luke Ryan, of Sharon, Pa.

This invention relates to that portion of re-
verberatory furnaces commonly known as the
neck and square—that is, the portion which
leads from the furnace to the smoke stack,
and through which the slag or cinder passes
as it flows out of the furnace. Heretofore
this portion of the furnace required to be re-
newed very frequently in consequence of the
action of the ignited gases and molten cinder
upon the fire-brick of which it is constructed.
The molten cinder and gas have a most destruc-
tive effect on the fire-brick, eating it away and
thereby enlarging the diameter or interior sur-
face space of the neck, and rendering the fur-
nace useless for the purpose of puddling or
boiling iron in a very short time, a week or ten
days being about as long as such a furnace can

form, the side walls being formed of rectan-
gular blocks E, and the roof by blocks
D, slightly arched on the under side, the
blocks F resting on the upper sides of the
blocks E, and all being properly cemented to-
gether. G represents a series of metallic
bands or bars having their ends bent at right
angles. They are made to fit the outside of
the blocks F, so as to clamp and hold them to-
gether and prevent them cracking or breaking
apart through the expansion and contraction
consequent on the heating up or cooling of the
furnace.

A sandstone neck constructed in the manner
herein described, and clamped with metal
bands, will withstand the action of the gases
of the puddling furnace without becoming dis-
integrated or crumbling away, and that the pas-
sage of the molten cinder through it does not
eat or plane away its sides as it does when fire-
brick is used, the effect being that the cinder
adheres to the sandstone and protects it instead
of cutting away its surface. As a result, there-
fore, the surface space or draft capacity of the
neck is never increased by the destruction of
the surface of the interior walls. The walls of the
square A may also be built of sandstone blocks,
but it is preferable to construct this part of



IMPROVEMENT IN PUDDLING FURNACES.—Fig. 1.

be used without a renewal or repair of the
neck. It has also been the custom heretofore
to build what is called the square or lower end
of the flue of solid walls of fire-brick having
only a small opening or notch for the cinder to
flow out of, which soon became choked up
with the material, and as the latter accumulates
in the neck, it interferes with the draft and
necessitates the removal of the bricks on the
end wall of the furnace in order to get at the
cinder and rake it out. The removal or repair
of the neck and pulling out and rebuilding of
the walls necessitate large outlay in labor and
material, and much valuable time is consumed
in repairs, during which the furnace stands
idle.

The invention is designed to remedy these
objections; and consists in constructing the
walls and roof of the neck with blocks of
sandstone instead of fire-brick, as hereto-
fore, the sandstone blocks being clamped
or held together with metal bands, as hereinaf-
ter more fully set forth. It also consists in the
use of a hinged door lined with fire-brick or
other refractory material, said door being lo-
cated in the cinder notch end of the furnace, so
that access can at all times be had to the in-
terior of the neck without having to tear down
the wall, as heretofore.

In the accompanying drawings, Figure 1 is
a side elevation of the neck and square or lower

the furnace of fire-brick, inclosed by the open
frame plates D, as shown in the drawings.
The plates D are connected and braced by
rods D', having threaded ends and nuts so that
they can be tightened up or unscrewed and re-
moved when required.

H represents a hinged metallic door set in
a metallic frame I, which forms the flue end
of the furnace. The door H is made like a
frame, so as to hold and sustain a lining of
fire-brick or other refractory material, and an
opening, J, is formed through it and its lin-
ing for the passage of the cinder. The door
plate is also made with openings through it,
like the plates D, to facilitate the escape of
the heat from the walls. With a door of this
construction access can at all times be had to
the interior of the neck and square, and
should the cinder accumulate therein in such
quantity as to interfere with the draft, it can
be raked out through the door, thereby obvi-
ating the necessity for tearing down the end
wall, as heretofore, and with the door the cinder
may be raked out without stopping the
operation of the furnace, which could not be
done with the old style of puddling furnace.

Claim.—1. The neck of a puddling or rever-
beratory furnace, constructed of blocks of
sandstone clamped with metal.

2. In a puddling or reverberatory furnace,
the hinged door H having a lining of fire-

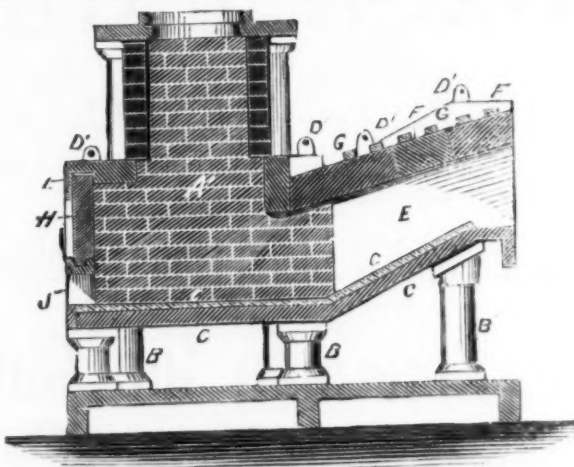


Fig. 2.

portion of the flue of a puddling furnace of the
improved construction. Fig. 2 is a longitudinal
vertical section, showing the interior.

A represents the neck of the furnace, and A'
the square or lower end of the flue or smoke
stack. Instead of being built of solid walls
founded in the ground, as usual in the construc-
tion of this portion of the furnace, it is
supported above the ground by columns, so that
a free circulation of air is maintained around
the walls, and the escape of the heat is thereby
promoted. By this method of construction a
great saving in fire-brick and clay is effected.
C is a plate of metal, which forms the bottom
or floor of the neck A and square A', the metal
being protected by a lining of sand, c. D D
are metal plates, which form the casing or
outer walls of the neck and square. These
plates have openings d through them to
facilitate the escape of the heat from the
refractory material of the walls of the furnace.
The openings d may be of any suitable or con-
venient form. The neck proper is formed of
blocks of sandstone of suitable size and

brick or other refractory material, and an
opening, or hole, J, for the passage of the
cinder.

IMPROVEMENT IN PROCESSES OF UTILIZING
BESSEMER STEEL WASTE.

Specification forming part of Letters Patent
No. 176,130, dated April 18, 1876; issued to
William Fields, of Wilmington, Delaware.

This invention relates to a process for utiliz-
ing the waste of Bessemer steel, and consists
in smelting the scrap, old rails and other waste
parts with certain ingredients, whereby the
steel is again made as fit for use as in the first
instance.

With the first charge of the waste Bessemer
steel in a cupola or blast furnace, to each ton
four pounds of chromate of iron, two pounds
of sal-ammoniac, two pounds of saleratus, one
pound of sal-soda, one pound of York ore, one
pound of litharge and twenty pounds of scale
of iron are added.

In the second charge, after the molten metal
has been run into the puddling furnace, the
following chemicals are added and well

stirred: Four to six pounds of chromate of
iron; two pounds of sal-ammoniac; one to two
pounds of black oxide of manganese; one
pound of antimony; one pound of wolfram;
one-half pound of salpeter; one gallon of fine
charcoal.

The metal is then run into molds or balled
up, hammered into blooms, and rolled into rails,
boiler plate, or bar steel, as desired. If the
steel is cast into ingots, no scale is used in the
second heat; but when it is to be balled up and
hammered and rolled, 30 pounds of iron scale
are used.

Claim.—The process herein described of util-
izing Bessemer waste steel, consisting of melt-
ing it twice in separate charges in the presence
of or mixed with chemicals, substantially as de-
scribed.

Centennial Notes.

ORR, PAINTER & CO.,

Reading, Pa., display a variety of useful stoves
the "Sunshine Range" being one of the most
prominent. This is a new range, patented in
1876; has illuminated front and dust flue, pipe
collar reversible from top to back, and polished
tops and bottoms. It is arranged with sheet flue
down one end, under the bottom and up the
back, so that the heat can be applied to all the
boiler holes at one time by the use of a single
damper; has a large fire-box with shaking and
dumping grate, ash sifter, dust flue, ash drawer
and portable hearth at the fire end. The range
has also a warming closet and low copper reser-
voir. The same range, with all the essential
features of the above, can be had with swing-
ing top extension, instead of reservoir with
water front. The "Clarion Range" is a five hole
range of beautiful design, illuminated end and
front, nickel door knobs, dust flue, large oven,
and is a good baker, and is sold at a low price.
The "Cadet Cook" is a new, light, low priced coal
cook, neat design, with shaking and dumping
grate, nickel door knobs, ash drawer, and other
modern improvements. The "Lighthouse
Cook," however, is their most prominent ex-
hibit, which they claim to be "the finest and best
high-hearth cook stove ever offered to the
trade, with the highest oven under the ash pit
of any stove in the market." It has basket or
shaking grate, illuminated sliding fire doors,
heavy covers and cross pieces, front feed door,
latest style of moldings, and all other improve-
ments usual in a stove of this kind. The
"Anchor Heater" is the last of their exhibits
which we shall refer to, and is at once of elegant
design, of the best material, an efficient
heater, with many recent improvements, and at
a moderate cost.

WILBRAHAM BROS.,

of Philadelphia, are the sole manufacturers of
Baker's pressure blower. In the manufacture
of pressure blowers one of the greatest diffi-
culties has been the apparent necessity of in-
side gearing, and an abutment to prevent back
action. The objections to placing machinery
in the interior are its liability to become
clogged and the inconvenience of repairing.
By the Baker patent the gearing, which con-
sists of three cog-wheels, is upon the exterior;
there is no friction whatever upon the interior,
and being self cleaning it is never necessary to
open it. In the inside of the blower is a main
drum, with two fans projecting from opposite
sides, which is circular, and as nearly air-tight
as possible without openings. In each corner
of the lower or square division is a drum of
equal size with the main one, but wanting the
fan attachment, and fitting as closely as pos-
sible both with each other and the fan drum
above. In each of the lower drums is a gap of
one-third the circumference to permit the pas-
sage of the fans. Upon the under side of the
square are two adjustable packing strips—one
fitting very closely against each lower drum.
There are two openings, one upon each side of
the square directly opposite the lower cylinders.
The fan drum is connected directly with the
driving power, the lower ones being geared to
it so as to attain a double velocity. Upon
the revolution of the main drum the air is
drawn in at one opening, and necessarily has
but one course, to follow the fans, the nearness
of the drums to each other and the packing
strips effectually preventing its passage below.
A recent improvement consists in making the
gaps of just sufficient size to permit the pas-
sage of the fans. In the old form this was
much too large, and consequently much air was
condensed in the center of the blower. These
can be used either as exhaust or pressure blow-
ers, and from the manner of their construction
discharge an equal volume of air at each semi-
revolution, and with very slight pulsation. In
setting a machine it is placed upon a brick
foundation, with an inlet pipe leading to it from
the most desirable place to take air. At the
Pomona Palace Exhibition, Manchester, Eng-
land, in July, 1875, this firm was awarded the
first prize—a gold medal. The conditions were
that the blower should give over 85 per cent. of
air from every theoretical 100. That this ma-
chine accomplished it the medal proves, but
how much, if any, more than the requisite per-
cent. was blown the firm was unable to ascer-
tain. They also obtained a first-class prize, the
James Watt Medal, from the Royal Cornwall
Polytechnic Society, of England, in the same
year.

A New Drawbridge.—A recently patented
drawbridge, designed to afford perfect facilities
for crossing navigable streams without impeding
navigation, is the invention of Lieut. Com.
H. H. Gorringe, U. S. N., of Washington.
The bridge is composed of a number of floats,
each pivoted or hinged at one end, the other
end being moored to anchor piles by means of
a chain passing over a windlass on the swinging
end of the draw or leaf. By revolving the
windlass the draw or leaf may be swung clear,
so as to afford vessels a single passage as wide
as the length of the draw; a reverse motion of
the windlass closing the draw and opening the
roadway. Since this operation may be per-
formed with either or all of the floats, vessels
may pass through the bridge at any point se-
lected, or the whole width of the river may be
thrown open to navigation. The inventor,
among other things, claims "cheapness and fa-
cility of construction, greater security than
ordinary bridges, freedom from obstruction to
navigation, and from risk of damage by fresh-
ets, moving ice, and other floating bodies."

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Cleveland, Brown & Co.

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Clays, Slags & Coal for Practical Metal-
lurgical Purposes.
No. 339 Walnut Street, Philadelphia.
J. BLODGET BRITTON.This Laboratory was established in 1866, at the instance
of a number of practical iron-masters, expressly to afford
prompt and reliable information upon the chemical com-
position of the substances above mentioned, for smelting
and refining purposes. The object being to make it at
once a convenient, practically useful, and comparatively
inexpensive adjunct to the Furnace, Forge and Rolling
Mill.

CHARGES TO IRON WORKS.

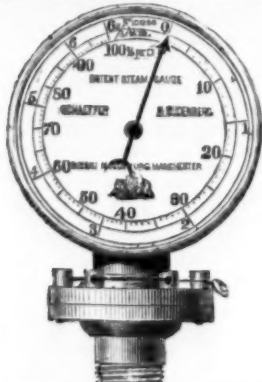
For determining the per cent. of Pure Iron in an
ordinary Ore..... \$1 00
For the per cent. of Pure Iron, Sulphur and Phos-
phorus in do..... 12 50
For each additional constituent of usual occur-
rence..... 1 50
For those of unusual occurrence or difficult to de-
termine, the charge must necessarily depend
upon circumstances.
For determining the per cent. of Sulphur and Phos-
phorus in Iron or Steel..... 14 00
For each additional constituent of usual occur-
rence..... 6 00
For the per cent. of Carbonate of Lime, and In-
soluble Silicious Matter in a Limestone..... 2 00
For the per cent. of Water, Volatile Combust-
ible Matter, fixed Carbon, and Ash in Coal..... 12 50
For determining the constituents of a Clay, Slag,
Coke, or of an Ash of Coal the charges will correspond
with those for the constituents of an ore.
For a written opinion or letter of instruction the charge
must necessarily depend upon circumstances.
Printed instructions for obtaining proper average sam-
ples for analysis furnished upon application.WALLACE & HUMPHREY,
Analytical Chemists,113 Walnut St., PHILADELPHIA.
Special attention given to analysis of Iron and Steel.

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Iron.

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Ovals, Half Rounds, Box Iron Cylinder Bars, Plow Beam Iron, &c. Also,
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All patterns kept in store or made to order. Link and Pin Iron in stock.

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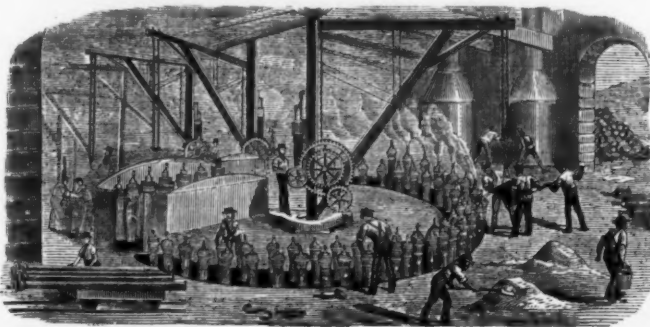
Merchant Bar Iron	20,000 tons.
Pig Iron	35,000 "
Railroad Iron	40,000 "
Railroad Splices and Couplings	5,000 "

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Manufacturers of and Dealers inHomogeneous Boiler & Fire Box Plates, Plate, Sheet, Pig & Railroad
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Tubes, Wrought Iron Steam and Gas Pipe.

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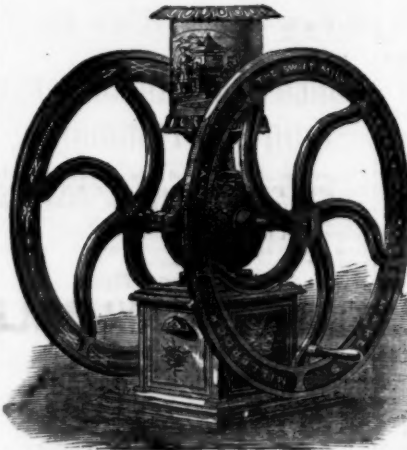
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BY J. E. MITCHELL, PHILADELPHIA.

(Concluded.)

FARMERS' GRINDSTONES.

There is no implement so essential, and no one to which so little attention is paid as the grindstone. The worn out, and worse than worthless "hubs" of the neighboring saw or edge tool factory, with a wooden axle, and set in the crotch of a tree, is considered, by some who know no better, as being all that is necessary to a farm in all other respects, perhaps, well stocked. But with the introduction of greatly improved agricultural implements, mowing machines especially, the need has been felt for something better than these primitive arrangements, and in order to keep pace with this onward march, improvements have been introduced, both in the grit and manufacture, as well as in the mode of hanging this indispensable article which, perhaps, may be new to most persons.

The best grindstones are now made by machinery, which renders them mathematically true, and the grit being selected of only the best quality, the getting of a good one is reduced almost to a certainty. The ordinary square cranks have been superseded by those made on the self-adjusting principle, which consists of a round shaft on which a screw is cut, and two plates, which are screwed together with a burr, so as to suit any thickness of stone which, by pressing against the sides of the stone instead of the shaft being wedged into the eye, prevents any possibility of splitting the stone, while at the same time it causes it to hang perfectly true on the crank. Another improvement is in the use of friction rollers, thereby reducing the friction just one-half, and enabling the farmer, with the use of a treadle, to grind any small tool without calling off some one from his work to "turn the grindstone." No grindstone should be exposed to the weather, as it not only injures the wood work, but the sun's rays harden the stone so much in time, as to render it useless; neither should it be run in water, as the part remaining in water softens so much that it wears away faster than the other side, and many a "soft place" in a stone has arisen from this cause alone and not from any inequality in the grit. The proper way is to allow the water to drop on the stone as it is needed, from an iron water cup, or, what answers very well, an old white lead keg, supported above the stone, with a spile near the bottom which can be driven in when not needed, and if kept filled with water will last a long time. Finally, the stone should not be allowed to get "out of round," as no tool can be properly ground unless the stone runs true. If it should become uneven get some one to turn it, and with a nail rod raise it down until it becomes perfectly round. Greasy or rusty tools should be well cleaned before grinding, or they will choke up the grit. If this should occur, a board pressed against the stone and a little sharp sand dropped between it and the stone while the latter is turning, will clean it off and sharpen up the grit.

HOW TO HANG AND USE THEM.

There is probably no appliance of the machine shop or manufactory to which so little attention is paid as the grindstone, and it is very rare indeed that this useful tool is found to be in perfect order. This is the more remarkable considering the great improvements made in the manufacture of iron and steel tools, on the perfection of which the precision and proper grit of the grindstone has a very important bearing. We propose to try to remedy this omission by offering some suggestions as to the selection of suitable grits, and the proper mode of adjusting, using and keeping grindstones in order.

There have been very decided improvements made over the old style of fixtures for hanging grindstones, which generally consisted of a square shaft, which was wedged into a square hole in the middle of the stone, at the imminent risk of bursting the stone when at rest, or of endangering the life of the grinder when in motion. Now, all shafts, from the smallest to the largest, are made of round iron (wrought), with a screw and nut, by means of which two cast iron plates are pressed against the sides of the stone, which is firmly held by pressure and friction, and relieving it from any tendency to burst, and adjusting it with the greatest precision. These plates are sometimes bolted to the sides of the stone, with a square shaft on which the stone is adjusted by means of screws passing through a projecting rim on the plates, but we think these holes have a tendency to weaken the stone.

Before adjusting the stone on the shaft the two sides should be made perfectly parallel, so that the flanges will bear evenly; then adjust the shaft, and if the stone does not run true the high side can be placed uppermost, and by gently uncrewing the nut and striking the stone it can be made to drop the desired distance, which can be indicated by the flange. In our largest establishments the stones are turned off perfectly true outside of the shop, so as to avoid the dust which injures the machinery, and by leaving a depression in the sides of the stone of the size of the flange it will run true without further labor. After being thus adjusted it should be kept true by the free use of the backer, and should not be allowed to stand in water. A diamond carbon tool is used where great nicety is required, and the sides of the stone are painted (without the use of oil, however), in order to prevent the moisture from entering, and thereby keeping the edges square.

Edge tools are fitted up by grinding, very much as a plank would be reduced in thickness were a large plane employed in which were set a hundred or more very small gongs, each cutting a narrow groove. The sharp grit of the grindstone being harder than the iron or steel,

cuts very small channels in the surface of the metal, and the revolving disk carries away all the minute particles that are detached by the grit. If we were to examine the surface of a tool that has just been removed from a grindstone, under the lens of a powerful microscope, it would appear, as it were, like the rough surface of a field which has been recently scarified with some implement which formed alternate ridges and furrows. Hence, as these ridges and furrows run together from both sides at the cutting edge, the newly ground edge seems to be formed of a system of minute teeth rather than to consist of a smooth edge. For this reason a tool is first ground on a coarse stone, so as to wear the surface of the steel away rapidly. Then it is polished on a wheel of much finer grit, and finally, in order to reduce the serrature as much as possible, a whetstone of the finest grit must be employed. This gives a cutting edge having the smallest possible serration. A razor, for example, does not have a perfect cutting edge, as one may perceive by viewing it through a microscope, and yet the serrations are actually so much smaller than a human hair that the minute teeth cut the hair in twain, but when the serrations on the edge of the razor become so battered up and dull that they will not sever a hair or cut a man's beard off, the edge must be honed and strapped until the system of minute teeth will be so much smaller than a hair that several of them will take hold of the smallest hair at once. These suggestions will furnish something of an idea of the operation in grinding and whetting edge tools. Beginners are sometimes instructed when grinding edge tools to have the stone revolve toward the cutting edge, and sometimes from it. When the first grinding is being done, this is a matter of indifference, but when the finishing touches are applied near and at the very edge, a grinder can always complete his task with more accuracy if the periphery of the grindstone revolves toward the cutting edge, as the steel that is worn away will be removed more easily. Whereas, when a stone runs in the opposite direction, the grinder cannot always tell exactly when the side of the tool is fully ground up to the edge. This is more especially true when the steel has a rather low or soft temper. The stone when running away from the edge will not sweep away every particle of the metal that hangs as a "feather," but when the stone revolves toward the edge, there will be no "feather edge" to deceive the eye of the grinder.

WHY GRINDSTONES BURST.

In olden times grindstones were always made with a square hole in the center, about 6 inches across, in which a square iron shaft was placed, and the stone adjusted by means of wooden wedges, driven around the shaft with sufficient force to hold the stone securely in its place, and to resist the power applied to the shaft when dressing the stone off. This resistance at the edge, being equal to a lever purchase of half the diameter of the stone, has a tendency to burst the stone by the pressure of the shaft in the eye of the stone, which is also frequently augmented by the swelling of the wood employed as wedges.

Bursting of grindstones was a common occurrence under these circumstances, happening sometimes soon after the stone was hung; but frequently after being weakened by wearing away a part of it. Grindstones are generally hung at mill works by means of two heavy cast iron plates with square holes and a heavy square boss cast on the outside. Four holes are bored through the stones near the corners of the eye, corresponding with the four similar holes in the plates, through which four bolts pass and fasten the plates securely to the sides of the stone by means of nuts. A square shaft passes through the center of the plates, and the stone is adjusted by means of eight set screws passing through the boss, and resting against the sides of the square shaft. This relieves the eye of the stone from any strain, but the tendency of the four holes in lines with the corners of the eye is to weaken the stone in these directions. A case occurred of grindstones having been burst by using cast iron plates with a square boss four inches long, cast on the inside of the plates and tapering toward the end, which was fitted snug into the eye of the stone, and the plates being pressed against its sides, the tapering boss acted as a wedge, and two stones were burst in this way before the cause was discovered.

The best mode of hanging a grindstone is on a round shaft of wrought iron on which a collar is forged, with two cast iron plates of about one-third the diameter of the stone in size, and dished so as to bear on the outside edge only. A screw is cut on the shaft and fitted with a heavy nut, by means of which the two plates are pressed against the sides of the stone, holding it firmly by pressure and friction alone, and relieving the eye from all strain. A stone hung in this manner should not burst except by centrifugal force, caused by the stone being run at a very high rate of speed; but stones do burst even when hung so, and when not running at a dangerous rate of speed. As the bursting of a grindstone is always fraught with great danger to the workmen using it, and in its vicinity, it becomes of considerable interest to know the cause. Grindstones vary very much in their composition and in the manner in which their particles are held together. Some stones are composed of grains of pure sand, which have been pressed together with little or no cementing material, leaving numerous interstices among their particles. In others, the particles of sand are cemented together with clay, rendering the stone much more compact and strong. A stone of the first kind, being porous, will weigh less than the cubic foot than the latter, and will absorb more water when in use, thereby rendering it still less strong. The quantity of water absorbed by a stone of this character has been proved by actual experiment to be equal to 12 pounds to

the cubic foot, while in the closer and more compact stones it is but 5½ pounds, so that if a dry porous stone of 6 feet diameter by 12 inches thick contains 27 cubic feet, it will absorb 324 pounds of water when in use; and when such a stone is allowed to stand over night, a considerable portion of the water will settle in the lower half of the stone, while the upper being exposed to a free circulation of air, will lose its water by evaporation and will be left comparatively dry, so that no matter how true the stone may be dressed, the effect, when in motion, will be the same as of a badly balanced fly-wheel, and with a little increase of the usual speed, the tendency will be, of the wet side, to fly off from the rest of the stone, or in other words, to burst the stone. A case of this kind recently occurred in New Jersey. A workman had been using a stone of this character for grinding sad irons. The stone being completely saturated with water over night, the following morning he started the stone (which was about 6 feet diameter by 1 foot thick), and after working a short time, had occasion to step aside for a few moments, when the stone burst, a portion of it passing through the roof and lodging in the side of an adjoining building, another struck a heavy driving shaft in front of the stone, and a third fell in the pit in which the stone was running. The usual speed of this stone was about 180 turns a minute, which it is supposed was somewhat increased by the absence of the grinder. The increase of the speed of an unbalanced stone of a porous character caused it to burst. Great care should be exercised in examining a stone for defects before hanging it. This can be best done by washing off the sides and edge with water and a broom, and if any crack be discovered, the stone should be rejected. No part of a grindstone should be allowed to stand in water when not in use, as this would but increase the tendency to burst in the manner above referred to, beside causing a soft place.

The English, Nova Scotia and Ohio grindstones are the principal kinds in use, but each of these sorts is subdivided into an endless variety of sizes and grits.

ENGLISH GRINDSTONES.

New Castle.—Yellow color and sharp grit; the fine soft ones for grinding saws, and the coarser and harder ones for sad irons and springs, pulleys and shafting (instead of turning), and for bead and face stones in nail works, and for castings (dry grinding).

Wickliffe.—Grayish yellow color; for grinding saws, squares, bevells, and cutters' work generally. A very soft grit to avoid taking out the temper.

Liverpool (or Melling).—Of a red color and very sharp grit; for saws and edge tools generally. An excellent grit for sharpening axes in ship yards.

Nova Scotia.—Blue or yellowish gray color, and of all grits, from the finest and hardest to the coarsest and softest; the large ones for grinding sad irons and hinges, springs and edge tools; the medium and small sizes for machine shops and for sharpening edge tools generally.

Bay Chaleur, N. B.—Of a uniform blue color, and soft, sharp grit; for manufacturing table cutlery, and is admirably adapted for machinists' tools, and for sharpening edge tools generally, when a fine edge is required.

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Brown.—White color, fine and sharp grit; for sharpening edge tools generally.

Amherst (Black River).—Brownish white color, soft, loose grit; for edge tools, and the very soft ones for saws.

Independence.—Grayish white color, and coarse sharp grit; for grinding springs and files, and for dry grinding of castings.

Mosillon.—Yellowish white color, coarse, sharp grit; for edge tools, springs, files and nail cutters' face stones, and for dry grinding of castings.

Harro (Michigan).—Of a uniform blue color, and fine, sharp grit; good for sharpening tools when a very fine edge is required.

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The remarkable race of two American ships from San Francisco to Liverpool—the Southern Cross and J. B. Brown—has recently attracted much attention. They left San Francisco on the same day (December 31st), and arrived at Liverpool May 26th together. They were 147 days in making the voyage, the remarkable character of the race not being its celerity, but the manner in which the ships, though for many days out of each other's sight, kept company. In fact two other vessels leaving San Francisco many weeks afterward caught up with these two ships. On February 12th two ships—the Centennial and the City of Philadelphia—sailed from San Francisco for Liverpool, the former arriving there May 34th and the latter May 36th, the same day as the two ships above mentioned. These voyages of 102 and 104 days respectively are the shortest made this season. The two Philadelphia vessels were about thirty-six hours apart in their arrival at Liverpool, owing to one being favored in getting a tug, whilst the other had to wait off the port over a day, the Centennial having entered the Channel about thirty miles ahead. In some respects this voyage is as remarkable as the other, whilst being much shorter in the time occupied. All four of the ships referred to were laden with grain.

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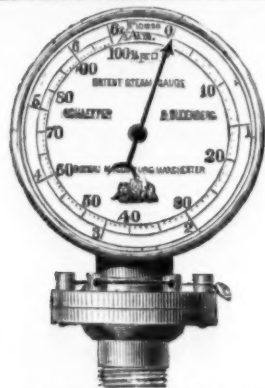
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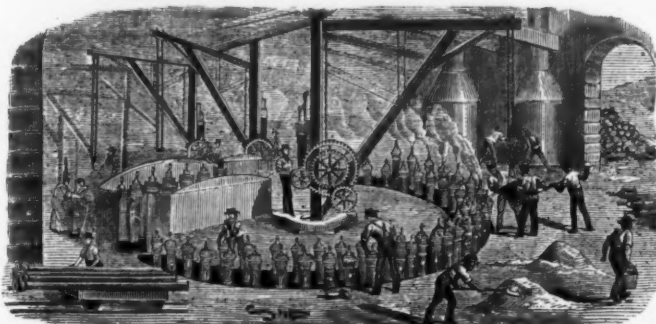
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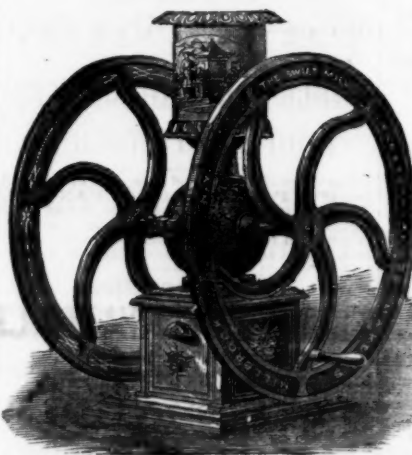
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**Grindstones.**

BY J. E. MITCHELL, PHILADELPHIA.

(Concluded.)

FARMERS' GRINDSTONES.

There is no implement so essential, and no one to which so little attention is paid as the grindstone. The worn out, and worse than worthless "hubs" of the neighboring saw or edge tool factory, with a wooden axle, and set in the crotch of a tree, is considered, by some who know no better, as being all that is necessary to a farm in all other respects, perhaps, well stocked. But with the introduction of greatly improved agricultural implements, mowing machines especially, the need has been felt for something better than these primitive arrangements, and in order to keep pace with this onward march, improvements have been introduced, both in the grit and manufacture, as well as in the mode of hanging this indispensable article which, perhaps, may be new to most persons.

The best grindstones are now made by machinery, which renders them mathematically true, and the grit being selected of only the best quality, the getting of a good one is reduced almost to a certainty. The ordinary square cranks have been superseded by those made on the self-adjusting principle, which consists of a round shaft on which a screw is cut, and two plates, which are screwed together with a burr, so as to suit any thickness of stone which, by pressing against the sides of the stone instead of the shaft being wedged into the eye, prevents any possibility of splitting the stone, while at the same time it causes it to hang perfectly true on the crank. Another improvement is in the use of friction rollers, thereby reducing the friction just one-half, and enabling the farmer, with the use of a treadle, to grind any small tool without calling off some one from his work to "turn the grindstone." No grindstone should be exposed to the weather, as it not only injures the wood work, but the sun's rays harden the stone so much in time, as to render it useless; neither should it be run in water, as the part remaining in water softens so much that it wears away faster than the other side, and many a "soft place" in a stone has arisen from this cause alone and not from any inequality in the grit. The proper way is to allow the water to drop on the stone as it is needed, from an iron water cup, or, what answers very well, an old white lead keg, supported above the stone, with a spigot near the bottom which can be driven in when not needed, and if kept filled with water will last a long time. Finally, the stone should not be allowed to get "out of round," as no tool can be properly ground unless the stone runs true. If it should become uneven get some one to turn it, and with a nail rod raise it down until it becomes perfectly round. Greasy or rusty tools should be well cleaned before grinding, or they will choke up the grit. If this should occur, a board pressed against the stone and a little sharp sand dropped between it and the stone while the latter is turning, will clean it off and sharpen up the grit.

HOW TO HANG AND USE THEM.

There is probably no appliance of the machine shop or manufactory to which so little attention is paid as the grindstone, and it is very rare indeed that this useful tool is found to be in perfect order. This is the more remarkable considering the great improvements made in the manufacture of iron and steel tools, on the perfection of which the precision and proper grit of the grindstone has a very important bearing. We propose to try to remedy this omission by offering some suggestions as to the selection of suitable grits, and the proper mode of adjusting, using and keeping grindstones in order.

There have been very decided improvements made over the old style of fixtures for hanging grindstones, which generally consisted of a square shaft, which was wedged into a square hole in the middle of the stone, at the imminent risk of bursting the stone when at rest, or of endangering the life of the grinder when in motion. Now, all shafts, from the smallest to the largest, are made of round iron (wrought), with a screw and nut, by means of which two cast iron plates are pressed against the sides of the stone, which is firmly held by pressure and friction, and relieving it from any tendency to burst, and adjusting it with the greatest precision. These plates are sometimes bolted to the sides of the stone, with a square shaft on which the stone is adjusted by means of screws passing through a projecting rim on the plates, but we think these holes have a tendency to weaken the stone.

Before adjusting the stone on the shaft the two sides should be made perfectly parallel, so that the flanges will bear evenly; then adjust the shaft, and if the stone does not run true the high side can be placed uppermost, and by gently unscrewing the nut and striking the stone it can be made to drop the desired distance, which can be indicated by the flange. In our largest establishments the stones are turned off perfectly true outside of the shop, so as to avoid the dust which injures the machinery, and by leaving a depression in the sides of the stone of the size of the flange it will run true without further labor. After being thus adjusted it should be kept true by the free use of the backer, and should not be allowed to stand in water. A diamond carbon tool is used where great nicety is required, and the sides of the stone are paluted (without the use of oil, however), in order to prevent the moisture from entering, and thereby keeping the edges square.

Edge tools are fitted up by grinding, very much as a plank would be reduced in thickness were a large plane employed in which were set a hundred or more very small gouges, each cutting a narrow groove. The sharp grit of the grindstone being harder than the iron or steel,

cuts very small channels in the surface of the metal, and the revolving disk carries away all the minute particles that are detached by the grit. If we were to examine the surface of a tool that has just been removed from a grindstone, under the lens of a powerful microscope, it would appear, as it were, like the rough surface of a field which has been recently scarified with some implement which formed alternate ridges and furrows. Hence, as these ridges and furrows run together from both sides at the cutting edge, the newly ground edge seems to be formed of a system of minute teeth rather than to consist of a smooth edge. For this reason a tool is first ground on a coarse stone, so as to wear the surface of the steel away rapidly. Then it is polished on a wheel of much finer grit, and finally, in order to reduce the serrature as much as possible, a whetstone of the finest grit must be employed. This gives a cutting edge having the smallest possible serration. A razor, for example, does not have a perfect cutting edge, as one may perceive by viewing it through a microscope, and yet the serrations are actually so much smaller than a human hair that the minute teeth cut the hair in twain, but when the serrations on the edge of the razor become so battered up and dull that they will not sever a hair or cut a man's beard off, the edge must be honed and strapped until the system of minute teeth will be so much smaller than a hair that several of them will take hold of the smallest hair at once. These suggestions will furnish something of an idea of the operation in grinding and whetting edge tools. Beginners are sometimes instructed when grinding edge tools to have the stone revolve toward the cutting edge, and sometimes from it. When the first grinding is being done, this is a matter of indifference, but when the finishing touches are applied near and at the very edge, a grinder can always complete his task with more accuracy if the periphery of the grindstone revolves toward the cutting edge, as the steel that is worn away will be removed more easily. Whereas, when a stone runs in the opposite direction, the grinder cannot always tell exactly when the side of the tool is fully ground up to the edge. This is more especially true when the steel has a rather low or soft temper. The stone when running away from the edge will not sweep away every particle of the metal that hangs as a "feather," but when the stone revolves toward the edge, there will be no "feather edge" to deceive the eye of the grinder.

WHY GRINDSTONES BURST.

In olden times grindstones were always made with a square hole in the center, about 6 inches across, in which a square iron shaft was placed, and the stone adjusted by means of wooden wedges, driven around the shaft with sufficient force to hold the stone securely in its place, and to resist the power applied to the shaft when dressing the stone off. This resistance at the edge, being equal to a lever purchase of half the diameter of the stone, has a tendency to burst the stone by the pressure of the shaft in the eye of the stone, which is also frequently augmented by the swelling of the wood employed as wedges.

Bursting of grindstones was a common occurrence under these circumstances, happening sometimes soon after the stone was hung, but frequently after being weakened by wearing away a part of it. Grindstones are generally hung at nail works by means of two heavy cast iron plates with square holes and a heavy square boss cast on the outside. Four holes are bored through the stones near the corners of the eye, corresponding with the four similar holes in the plates, through which four bolts pass and fasten the plates securely to the sides of the stone by means of nuts. A square shaft passes through the center of the plates, and the stone is adjusted by means of eight set screws passing through the boss, and resting against the sides of the square shaft. This relieves the eye of the stone from any strain, but the tendency of the four holes in lines with the corners of the eye is to weaken the stone in these directions. A case occurred of grindstones having been burst by using cast iron plates with a square boss four inches long, cast on the inside of the plates and tapering toward the end, which was fitted snug into the eye of the stone, and the plates being pressed against its sides, the tapering boss acted as a wedge, and two stones were burst in this way before the cause was discovered.

The best mode of hanging a grindstone is on a round shaft of wrought iron on which a collar is forged, with two cast iron plates of about one-third the diameter of the stone in size, and dished so as to bear on the outside edge only. A screw is cut on the shaft and fitted with a heavy nut, by means of which the two plates are pressed against the sides of the stone, holding it firmly by pressure and friction alone, and relieving the eye from all strain. A stone hung in this manner should not burst except by centrifugal force, caused by the stone being run at a very high rate of speed; but stones do burst even when hung so, and when not running at a dangerous rate of speed. As the bursting of a grindstone is always fraught with great danger to the workmen using it, and in its vicinity, it becomes of considerable interest to know the cause. Grindstones vary very much in their composition and in the manner in which their particles are held together. Some stones are composed of grains of pure sand, which have been pressed together with little or no cementing material, leaving numerous interstices among their particles. In others, the particles of sand are cemented together with clay, rendering the stone much more compact and strong. A stone of the first kind, being porous, will weigh less than the cubic foot than the latter, and will absorb more water when in use, thereby rendering it still less strong. The quantity of water absorbed by a stone of this character has been proved by actual experiment to be equal to 12 pounds to

the cubic foot, while in the closer and more compact stones it is but 5½ pounds, so that if a dry porous stone of 6 feet diameter by 12 inches thick contains 27 cubic feet, it will absorb 324 pounds of water when in use; and when such a stone is allowed to stand over night, a considerable portion of the water will settle in the lower half of the stone, while the upper being exposed to a free circulation of air, will lose its water by evaporation and will be left comparatively dry, so that no matter how true the stone may be dressed, the effect, when in motion, will be the same as of a badly balanced fly-wheel, and with a little increase of the usual speed, the tendency will be, of the wet side, to fly off from the rest of the stone, or in other words, to burst the stone. A case of this kind recently occurred in New Jersey. A workman had been using a stone of this character for grinding sad irons. The stone being completely saturated with water over night, the following morning he started the stone (which was about 6 feet diameter by 1 foot thick), and after working a short time, had occasion to step aside for a few moments, when the stone burst, a portion of it passing through the roof and lodging in the side of an adjoining building, another struck a heavy driving shaft in front of the stone, and a third fell in the pit in which the stone was running. The usual speed of this stone was about 180 turns a minute, which it is supposed was somewhat increased by the absence of the grinder. The increase of the speed of an unbalanced stone of a porous character caused it to burst. Great care should be exercised in examining a stone for defects before hanging it. This can be best done by washing off the sides and edge with water and a broom, and if any crack be discovered, the stone should be rejected. No part of a grindstone should be allowed to stand in water when not in use, as this would but increase the tendency to burst in the manner above referred to, beside causing a soft place.

The English, Nova Scotia and Ohio grindstones are the principal kinds in use, but each of these sorts is subdivided into an endless variety of sizes and grits.

ENGLISH GRINDSTONES.

New Castle.—Yellow color and sharp grit; the fine soft ones for grinding saws, and the coarser and harder ones for sad irons and springs, pulleys and shafting (instead of turning), and for bead and face stones in nail works, and for castings (dry grinding).

Wicklow.—Grayish yellow color; for grinding saws, squares, bevels, and cutters' work generally. A very soft grit to avoid taking out the temper.

Liverpool (or Melling).—Of a red color and very sharp grit; for saws and edge tools generally. An excellent grit for sharpening axes in ship yards.

Nova Scotia.—Blue or yellowish gray color, and of all grits, from the finest and hardest to the coarsest and softest; the large ones for grinding sad irons and hinges, springs and edge tools; the medium and small sizes for machine shops and for sharpening edge tools generally.

Bay Chaleur, N. B.—Of a uniform blue color, and soft, sharp grit; for manufacturing table cutlery, and is admirably adapted for machinists' tools, and for sharpening edge tools generally, when a fine edge is required.

OHIO.

Brown.—White color, fine and sharp grit; for sharpening edge tools generally.

Ashcroft (Black River).—Brownish white color, soft, loose grit; for edge tools, and the very soft ones for saws.

Independence.—Grayish white color, and coarse sharp grit; for grinding springs and files, and for dry grinding of castings.

Massillon.—Yellowish white color, coarse, sharp grit; for edge tools, springs, files and nail cutters' face stones, and for dry grinding of castings.

Huron (Michigan).—Of a uniform blue color, and fine, sharp grit; good for sharpening tools when a very fine edge is required.

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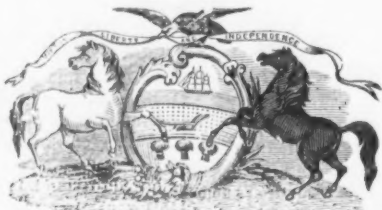
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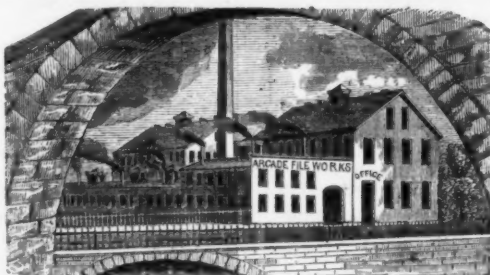


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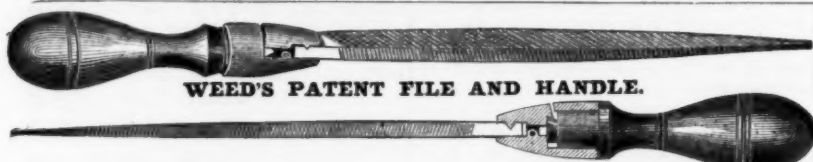
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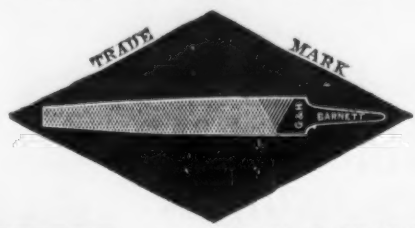
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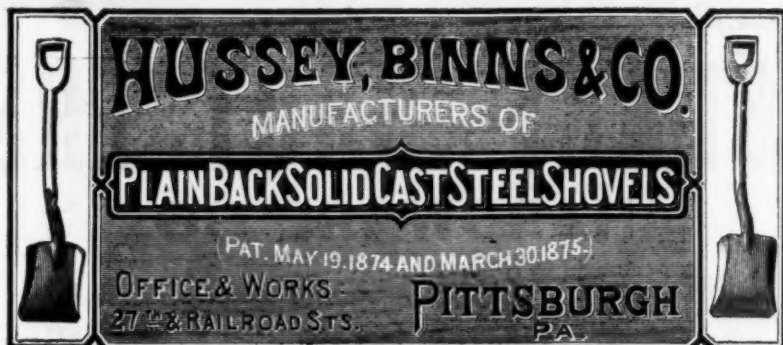
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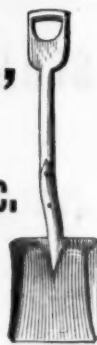
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Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 75 CHAMBERS STREET, N. Y., where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above named goods made from samples, to order.

Hoisting Machinery
Manufactured by
Crane Bros. Mfg. Co.,
CHICAGO.
COOKE & BEGGS, Agents, 16 Cortlandt
Street, New York.

Tempered Steel Spiral Springs,
OF ALL SIZES AND DESCRIPTIONS, made to order by
JOHN CHATILLON & SONS, 91 & 93 Cliff St. N. Y.
Our Springs are used by the U. S. Government, and various Military, Naval and other Scientific Institutions.

CLARK & CO.'S
PATENT
Self-Coiling, Revolving
NOISELESS
STEEL SHUTTERS
FOR
Store Fronts & Rear Windows.
FIRE AND BURGLAR PROOF.
Also, SELF-COILING
Wood Shutters
in various kinds of wood, suitable for Store Fronts,
Private Houses, Offices, and School Partitions.
The Best & Cheapest Shut-
ters in the World.
All Ideal Estate owners are invited to inspect them at
the factory.
162 & 164 West 27th Street, New York.
And at London, Paris, Vienna, Mel-
bourne, &c.

LOUIS RAISER,
Successor to GEORGE REUTHER,
Machinist, Model and
Lathe Maker.
125 & 127 Worth Street, NEW YORK
Bet. Centre & Elm Sts. (Saw Mill)
Residence, 214 Canal St.

Champion Centennial
MATCH SAFE.
Exposing one match at a time.
Plain, \$50 per gross.
Ornamental, \$25 per gross.
Agents wanted in every
county throughout the State.
PRICE EVANS,
Sole Owner of Patent,
635 Greenwich St., N. Y.

CLARK & CO.'S
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Self-Coiling, Revolving
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THE DOUGLASS MFG. CO.,

New York Warehouse, 62 Reade Street. P. O. Box 2610.

FACTORIES, Seymour, Conn.

MANUFACTURERS OF

PREMIUM
Mechanics' Tools,
COOK'S
Boring Implements
Price List and Discount Sheet furnished
on application.

Chisels, Gouges and Drawing Knives of all kinds, Screw Drivers,
Screw Driver Bits, Cook's and Douglass Mfg. Co.'s Augers &
Bits, Wood and Metal Head Gimlets, Improved Hollow
Augers, Blake's Patent Extension Bits,
Boring Machines, Chisel Handles, Wood Boxes, Tool Chests.

THE HURRICANE FORGE.
(PATTERSON'S PATENT.)
Also Stationary Forges.
Large Size, superior to stone or brick. Can be used with bel-
lows or fan. Send for prices and further information to
GEORGE PLACE, General Agent,
121 Chambers & 103 Reade Sts., N. Y.

S. H. & E. Y. MOORE,
68 Lake Street, CHICAGO, ILL.,
AGENTS FOR
PROVIDENCE TOOL COMPANY, PROVIDENCE, R. I.
Thrashing Machine Teeth, Cold Pressed Nuts, Chain Links, Ship Chandlery, &c.
THE READING BOLT AND NUT WORKS, READING, PA.
Hot Pressed Nuts, Machine Bolts, Lag Screws, Skein Bolts, Bolt Ends, &c.
WM. H. HASKELL & CO., PAWTUCKET, R. I.
Gimlet Point Coach Screws, Bolts, &c.
FALLS RIVET COMPANY, CUYAHOGA FALLS, O.
Norway Iron Rivets.

S. H. & E. Y. MOORE,
68 Lake Street, Chicago, Ill.
Manufactured and for sale by
S. H. & E. Y. MOORE,
68 Lake Street, Chicago, Ill.

"CLIMAX"
Barn Door Hangers,
Manufactured and for sale by
S. H. & E. Y. MOORE,
68 Lake Street, Chicago, Ill.

The wheel is acted upon directly by the rail. The
hub of this wheel revolves within chilled iron rollers.
The difference between the diameter of the wheel
and the diameter of the hub gives the leverage
gained. The hanger has the advantage of this lev-
erage in addition to that obtained from the use of
anti-friction roller bearings, and in this respect, as
well as in others apparent on examination, is superi-
or to any yet offered to the trade. It requires no
oil.

IT COMBINES
SIMPLICITY, EASE OF ACTION, STRENGTH,
DURABILITY, BEAUTY OF DESIGN.

FOR SALE BY

J. Clark Wilson & Co., Biddle Hardware Co., Buhl, Ducharme & Co., Geo. Worthington & Co., Jos. Woodwell & Co., J. H. Work, Hamilton & Mathews, Homer Foot & Co., J. M. Warren & Co., Barker, Whitaker & Co.,	New York, Philadelphia, Detroit, Mich., Cleveland, O., Pittsburgh, Pa., Boston, Mass., Rochester, N. Y., Springfield, Mass., Troy, N. Y., Providence, R. I.	Perin & Gaff Mfg. Co., McCombs, Caruth & Hyman, C. E. Walbridge, McCarthy & Redfield, John R. Kelso, Jr., F. S. Bradley & Co., Maurice E. Vile, Geo. M. Way & Co., Loomis, Barnett & Pritz,	Cincinnati, O., St. Louis, Mo., Buffalo, N. Y., Syracuse, N. Y., Baltimore, Md., New Haven, Conn., Albany, N. Y., Hartford, Conn., Dayton, O.
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And the trade generally.

BUSINESS ITEMS.

MASSACHUSETTS.
N. Wood & Co., of Plymouth, are man-
ufacturers of zinc plate for making tacks
and nails. They employ six hands and turn
out 150 to 200 tons per year for the New
England and Western trade. The mill is 30x
40 and run by water-power. The goods are
sold direct from the factory. This firm was
established in 1849.

Oliver Edes, of Plymouth, manufactures
sheet zinc for nails and tacks, keeping six
hands constantly employed and turning out
from 250 to 300 tons per year for the New Eng-
land trade. He has three mills, 40x25, 30x25,
and 15x12, and uses water-power.

Samuel Loring, manufacturer of tacks, brads,
nails and rivets from iron, copper and brass,
at Plymouth, keeps sixty-five hands con-
stantly employed, and turns out from 800 to
1000 tons of tacks and rivets per year for the
New England and Western trade. He also ex-
ports to South America, Australia and Ger-
many. The trade is good, the factory being
behind the orders on rivets and obliged to run
night and day. The factory is supplied with
an 80 horse-power Putnam engine, and two
Harris & Loring boilers.

The Plymouth Mills, Plymouth, the oldest
manufacture of rivets by machinery in the
country, manufacture rivets, iron water
wheels, mill stock, and general machinery,
keeping in stock all the different sizes of iron
and tin rivets in common use, and making to
order copper, brass, or iron rivets of any size.
They employ twenty-two hands. The goods are
made for the New England and Western trade,
beside exporting to some extent. They sent a
heap crusher to the exhibition at Santiago,
Cuba, for which they received a bronze medal.
They now are making hand planers, which are
on exhibition at the Centennial. The factory is
25x50, with an L 30x20; a nailing house, 30x
60; packing, 20x30; machine shop, 72x36; and
pattern shop, 15x25. The business done at present
is fair, but the price cannot be considered satisfactory.

The shovel works at Easton, are running
only five days in a week.

The Richmond Iron Works, West Stock-
bridge, have discharged most of their help
and suspended mining operations for the
present.

RHODE ISLAND.
The Rhode Island Horse Shoe Co.'s Works
are idle.
The Woonsocket Machine Company have just
shipped 18 boxes of machinery to Amsterdam,
Holland.

NEW YORK.
The Sterling Iron and Railway Company have
blown in one of their furnaces.
The puddle mill at Rome is still idle.
The mills at Buffalo are all reported idle, and
have been so for three weeks, and yet, accord-
ing to some workmen, the times are so good
as to justify a demand for an advance.

PENNSYLVANIA.
The Allentown Iron Company have blown out
four of their furnaces.
The stock of iron on hand at the Allentown
furnaces is estimated at over 40,000 tons.

We have already referred to the fact that the
Wampun Furnace Company had been using
part native coke in making iron. They were so
well pleased with its success that they are build-
ing 12 more coke ovens, with the intention of
making at home all they use.

The Mount Hickory Furnace was blown out
on the evening of the 9th.
The Erie Rolling Mill has been sold by the
assignees for \$147,000, which is by much the
best price we have heard for any iron property
lately.

Slag from iron furnaces is being utilized
in Lebanon for sidewalk pavements. Fifty
thousand feet have been put down in that
town. The Times says everybody admires the
beautiful pavements made of the material.
The tiles or blocks have been fairly tested, and
have uniformly given satisfaction. They are as
durable, if not more so, as any other material
known, and make a good appearance, are easily
laid down, and the expense thereof when laid
is not much more than that of first-class brick.

Raw bituminous coal was first used in the
furnaces of Mercer county in 1845.
One of the Shenango furnaces, at Middlesex,
we are pleased to learn, will go into blast soon,
and the other will go into blast soon after.
We have not learned who takes charge of these
furnaces.—Sharon Herald.

The Allentown Rolling Mill resumed opera-
tions on the 10th.

The Lehigh Iron Company will blow in as
soon as they can make satisfactory contracts
for coal.

The Empire Car Works, of York, are to build
four hundred freight cars for the Texas Pacific
Railroad.

The Phoenix Iron Co. have shipped a bridge
span 307 feet in length to Havre de Grace for
the Philadelphia, Wilmington and Baltimore
Railroad.

The property of the Lancaster Watch Factory,
including machinery was sold on the 12th
instant for \$36,000. It was bid in for the old
stockholders.

Hope Furnace is out of blast.
Mr. Josiah Copley, an old Pittsburgh editor,
in some reminiscences, says: "The memory of
the writer stretches back to about 1807, and
clusters mostly around a cabin house on the
bank of Mill Creek in Ligonier Valley, in
Westmoreland county. St. Clair's Furnace—
Armitage Furnace, I believe—was in the neigh-
borhood, at which they made pots and kettles,
grates, andirons and 'ten-plate stoves.' I
suppose some pig iron was made too, but as
there was no forge west of the mountains at
that day, I know not what they could do
with it."

The new gas wells at Beaver Falls, which
struck gas at 500 feet, will be reamed out to 12
inches and tubed, so as to utilize the present
product, while a 3 inch bore will be carried
down to 2000 feet, if necessary, to test the lower
strata for other veins.

Edward Gough, of Allentown, brass and iron
founder, has just turned out six rolls for a roll-
ing mill in Vera Cruz, Mexico.

Chas. W. Packer, Philadelphia, recently
made sales of ice cream freezers for Tiflis,
Southeastern Russia, also for Spain and Val-
paraiso, S. A.

Chas. G. Blatchley made a sale of ice cream
freezers last Saturday for shipment to Japan.

PITTSBURGH AND VICINITY.
The Lucy Furnace has been in a peck of
trouble the past week on account of an incip-
ient chill. The trouble is well over now, how-
ever.

The coal miners on the Monongahela River
have struck for 3 cents per bushel of 76 lbs.
All the works are idle except Brown's, Hays &
Brothers' and the Beck Iron Works, and will
probably remain so until fall, as there is an
abundant supply of coal both here and below.

The arrangements for boiler bursting at the
Munhall farm were disturbed by the late storm,
and extensive repairs will be necessary.

On last Thursday morning the pipe mill of
Messrs. Spang, Chalfant & Co. was burned to
the ground. The loss will not exceed the in-
surance—\$11,000.

Shoenberger Furnace No. 1 is out of blast.

We hear that the Zug mill property will soon
be offered for sale again, with a good prospect
of being sold.

The Cosmos Oil Works, near Pittsburgh, was

burned on Wednesday, the 12th. Loss, \$10,000.
Work on the new stack at the Lucy is pro-
gressing quite favorably. The foundations are
completed, and the iron columns are being put
in place.

The two converters at the Edgar Thomson
Steel Works have been irreverently named
Moody and Sinkey, because of their converting
triumphs.

WEST VIRGINIA.
The Riverside Iron Works, Wheeling, are
about to erect an addition, 80x110 feet, in which
to manufacture railroad spikes and light rails.
Two more boiling and two heating furnaces will
be required, with squeezer, muck train and
other machinery.

OHIO.
From the historical account of Lawrence
county, read July 4th, we glean the following:
"In 1826 James Rodgers, John Means, John
Sparks and Valentine Fear built the Union Fur-
nace, the first in the county, and put it in blast
in 1827. The first rolling mill was at Hanging
Rock, it having been changed from a forge in
1840 by Henry Hanna. The forge was built
in 1832 by Andrew Ellison, James Rodgers and
Robert Hamilton. The first foundry was built
by Peebles, Wood & Co., in 1844, near where
the block of Means, Kyle & Co. now stands in
Hanging Rock. There are now two rolling
mills, with a yearly capacity of 17,500 tons, in
Lawrence county, one nail mill, with a capacity
of 170,000 kegs of nails, and 15 blast furnaces
in the county, capable of producing 96,300 tons
of pig iron yearly."

The Bourne & Knowles Nut and Washer
Works, Cleveland, have continued to run their
works thus far to their full working capacity.

The Cleveland Spring Works are working up
from 75 to 80 tons of steel per month. The
works are being run about three-quarters full.

The Powell Tool Company, Cleveland, recent-
ly made a sale of 600 dozen of their superior
axes to Canadian parties. The tools made by
this company rank deservedly high in the mar-
ket.

Fulton having blown out, all the Jackson
furnaces are now out of blast. Fulton is put-
ting in a new hearth, and will not resume op-
erations before several weeks.

The Girard mill is running along as usual.

The Ironton Foundry, of Meigs, Olinhaber &
Co., was totally destroyed by fire on the eve-
ning of the 10th. The loss will be about \$50,000;
insured for \$40,000. This foundry was the first
established iron industry in Ironton; was built
in 1859, and made the first melt in May, 1861.

Of the stone-coal furnaces in and near Iron-
ton, the Belfont, Iron and Steel Company's and
the Ashland are out of blast. The Norton and
Alice are blowing.

The Zanesville furnace has been nearly five
years in blast on the same hearth.

The Hecla Furnace is in blast, making about
10 tons of the very best cold-blast charcoal iron
per day.

Furnace No. 1 of the Cleveland Rolling Mill
Company has been blown out for repairs.

The Iron Molders' International Association
was in session in Cleveland the major part of
last week. About 80 delegates were present,
representing nearly every State in the Union.
During the past two years the Association has
disbursed over \$16,000 for strikes and paid
\$44,000 indebtedness. Resolutions were adopted
favoring reform in the present system of prison
labor.

TENNESSEE.
The Wagon Car and Foundry Company, of
Chattanooga, have just completed a first-class
baggage car for the Northeastern Railroad of
Georgia; also, a number of side-dumping
freight cars for Rising Fawn Iron Company.

Part of the machinery of W. B. Lewis &
Co.'s saw works, now removing from Dayton,
Ohio, to Chattanooga, has arrived at the latter
place.

The Tennessee Iron and Steel Company,
Chattanooga, have organized by the election of
Mr. L. Scofield, Sr., as president and manager;
Mr. O. L. Packard, treasurer and general agent;
and Mr. L. Scofield, Jr., secretary and assistant
manager. The building of the company is
now complete, occupying a commanding site,
fronting immediately on the railroads, and ad-
jacent to the business center of the city. The
machinery, we understand, is complete and per-
fect up to date in all improvements. Some of
it is already in the building, the remainder to
be shipped shortly from the various points
where manufactured.

The Nashville American says that 1200 tons of
steel rails for the Western and Atlantic, and
1000 tons for the Nashville, Chattanooga and
St. Louis railways have arrived at Johnsonville
from Pittsburgh.

INDIANA.
The new Albany rail mill is idle at present.

Most of the nail machines in the Terre Haute
mill were brought from the old Coleman &
Rahn mill at Pittsburgh.

MISSOURI.
Mines, Metals and Arts says: "The Vulcan
Bessemer Steel Works will be ready to start
into full operation this day week (July 20).
Steel could be made on Monday next, but to
line and dry the converters will require a few
days longer."

The large iron foundry of Shickie, Harrison
& Co., on Thirteenth street, St. Louis, was
burned on the 12th. A large amount of valu-
able machinery was destroyed, or seriously in-
jured. The loss is about \$60,000, partly cov-
ered by insurance. About an hour later the
nut and bolt factory of H. E. Moran & Brother,
corner of Main and Florida streets, caught fire,
and was nearly destroyed. The loss is about
\$25,000.

ILLINOIS.
At Chicago the South Mill is running steady.
The steel mill is idle. The rail mill is putting
on a new roof, and the Bessemer department
is having added two new speigel cupolas. They
will start up about the 17th inst.

The annual meeting of the stockholders of
the North Chicago Rolling Mill Company was
held on Saturday, and the following officers
elected for the ensuing year: O. W. Potter,
president; Chicago; S. Clement, treasurer,
Waukegan; R. C. Hannah, secretary, Chicago.
Directors—S. P. Burt, New Bedford, Mass.; S.
Clement, Chicago; O. W. Potter, Chicago.
The president's report was somewhat lengthy,
and showed that notwithstanding the late finan-
cial depression the affairs of the company were
in a favorable condition. No dividend will,
however, be paid, but the earnings carried to
the surplus account, which is now over \$500,-
000. The disbursements for the year ending
July 1 amounted to \$3,747,719.12, and the prod-
uct was 42,638 gross tons of steel rail, 13,154
gross tons of iron rails, or 61,792 tons of both
kinds, and 34,389 gross tons of pig iron.

KENTUCKY.
The Ashland Furnace is repaired, and will
probably blow in in a week or ten days.

The Norton Iron Works nail mill is idle, and
will probably remain so the entire month;
cause, light demand for nails.

MICHIGAN.
Operations at the Erie Mine have been sus-
pended.

The Republic Iron Company are shipping
about 140 cars per day. Up to the last Thurs-
day in June they had shipped 4761 cars, averag-
ing 7 tons to a car.

The exports from Philadelphia for the year
ending June 30 were over forty million dol-
lars, against twenty-eight millions correspond-
ing time previous year.



TACKS

FACTORY, Fairhaven, Mass.

AMERICAN TACK CO., SALESDROOM, 117 Chambers St., N. Y.

Upholstery, Gimp, Brush, Card, Pail and Cheese Box Tacks; Leathered, Tinned and Iron Carpet Tacks; Bright and Blued Finishing Nails; Cigar Box and Chair Nails; Trunk and Clout Nails; Brads, Patent Brads, Copper Tacks and Nails; Iron, Zinc, Steel and Copper Shoe Nails; Polished 2d and 3d Fine Nails; Roofing and Siding Nails; Roofing Tacks, Tinned Tacks and Nails of every variety. Also, Bright and Japanned Lining and Saddle Nails, Tufting Buttons and Nails of any color. Any size or style of Tack or Nail made to sample. Orders sent to either Factory or Salesroom will receive prompt attention.

LEIGHTON BRIDGE AND IRON WORKS,

Rochester, N. Y.

Wrought Iron Riveted
Lattice Railroad

AND
HIGHWAY BRIDGES.

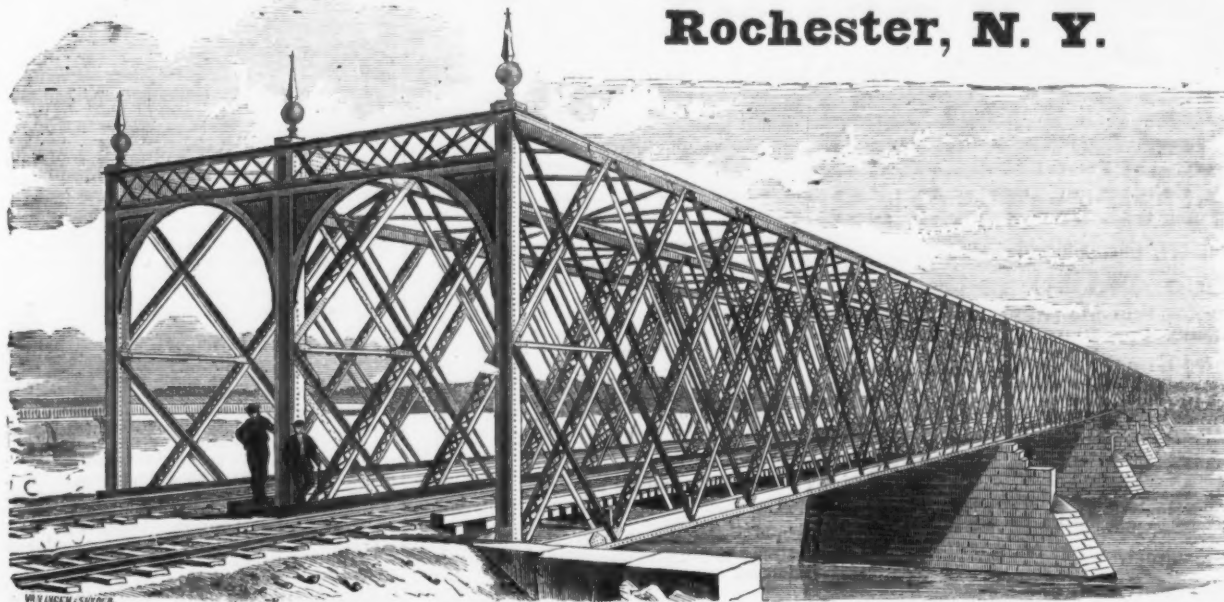
Wrought Iron
WATER PIPE.

The most economical and durable Pipe man-
ufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers
and Contractors.

[Accompanying engraving represents the Spring-
field Bridge, built by the Leighton
Bridge and Iron Works.]

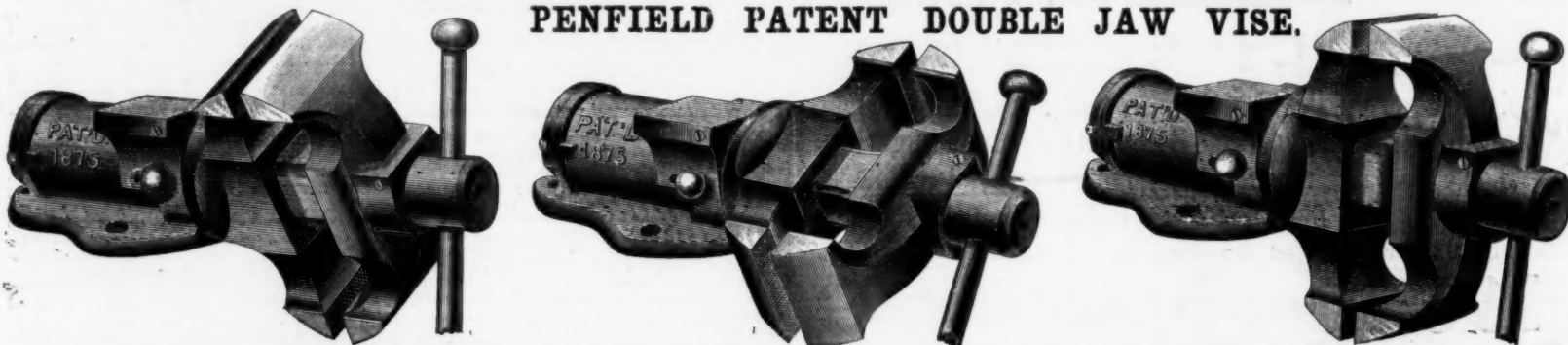


SPRING PERCH CO., Bridgeport, Conn.

Established 1843. Manufacturers of FIRST QUALITY

SPRINGS & AXLES

And Beer's Patent Curtain Rollers, Concealed Hinges, Etc., Springs of any pattern made to order. Send for Circular and Price List.



PENFIELD PATENT DOUBLE JAW VISE.

We call your attention to a new form of Patent Vise, possessing double jaws, which may be so adjusted as to hold an object at any desired angle with great firmness. This arrangement offers great advantages over any other Vise, as the operator can place his work at any angle best suited to his convenience. On the standard there is a spring bolt, which, when it is desired to adjust the jaws, is drawn back, and the jaws are set at any desired position. The face of one pair of jaws are roughened, and those of the other pair are smooth, to suit different kinds of work. The whole construction of the Vise is such as to prevent any chips or filings entering the working parts. Into the end of the standard is placed the flange nut, into which passes the Vise screw, which is on a direct line with the flange nut, which is held in its position at the rear end of the standard by two steel screws holding it firmly in its place. Send for Circular and Price List.

Manufactured by ELMORE PENFIELD, Middletown, Conn.

J. CLARK WILSON & CO.,

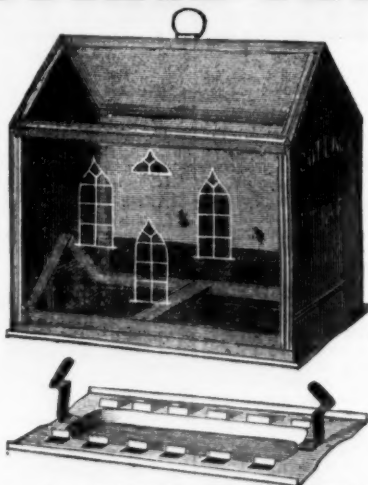
Manufacturers and Jobbers of Hardware,

81 Beekman Street, New York. P. O. Box 2355.

AGENTS FOR

THE COTTAGE FLY TRAP.

It has Won the Praise of Thousands.



Patented August 18, 1874.

The above cut shows the shape and design of the COTTAGE FLY TRAP. It is JAPANNED & dark red color, with bronzed border, the ends neatly lettered and ornamented. It has a NEAT AND ATTRACTIVE APPEARANCE, and does not look out of place in the dining room or parlor.

The experience of last year warrants us in fully recommending it as THE BEST FLY TRAP IN THE MARKET. It surpasses all others in catching flies, its capacity for doing so being FOUR TO SIX TIMES GREATER than the so-called "Cone Traps." It is compact, and its construction is so simple that a child can bait and manage it. Its price is low as compared with all others. A trial will convince any one that it has no superior. PUT UP IN BOXES OF ONE DOZEN EACH.

PRICE PER DOZEN, \$6.00.

Special prices made to large dealers. We solicit your orders.

MALTBY, CURTISS & CO.,

34 READE STREET, NEW YORK, Manufacturers of

Maple Faucets with Metal Keys.

The best Faucet made. Warranted to stay tight.

CAPEWELL'S GIANT NAIL PULLER, THE NATIONAL ICE
CHISEL, THE NOVELTY ICE BREAKER.

WESTON'S Differential Pulley Blocks

Also known as

DOYLE'S, HALL'S AND BIRD'S

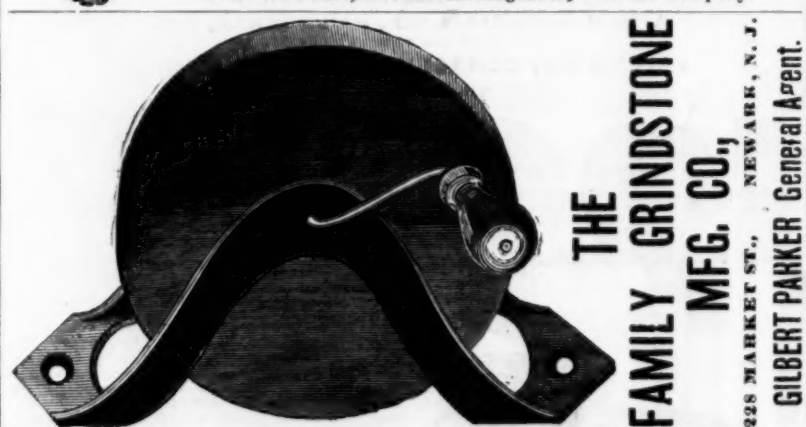
are now all merged and are controlled exclusively by

THE YALE LOCK MFG. CO.,

HENRY R. TOWNE, President, Stamford, Conn.

VAN WART & MCCOY, New York Agents, 134 & 136 Duane Street.

T. A. WESTON, Mechanical Engineer, with the Company.



THE
FAMILY GRINDSTONE
MFG. CO.,
NEWARK, N. J.
GILBERT PARKER General Agent.

PHILIP S. BIGLIN,

Successor to W. F. SHATTUCK & CO.,

Manufacturers' Agent for

AMERICAN HARDWARE.

95 Reade & 113 Chambers Sts., New York,

Cox & Tait's Pat. Wrenches. Holroyd's Stocks & Dies. Eddy's Lamp Black. Shattuck's Platform Scales. C. A. Wellman & Co., Gimlets and Gimlet Bits. Augers and Auger Bits. K. C. Maltby's Cocoa Nut & Britanna Biscuits. Patent Tap Barrels. Cortlandt Horse Nails.



The Original Inventors and Manufacturers of the
OSBORN BRIGHT METAL CAGES.

Also OSBORN & DRAYTON Improvements under
twelve different patents. We are continually bringing
out new and beautiful designs to meet the demands of
refinement and taste.

ALVAN DRAYTON, General Agent.

JOHN MAXHEIMER,

Manufacturer of

Japaned & Patent Eureka Bright Metal

BIRD CAGES,

247 and 249

Pearl Street,
NEW YORK.

FULL SIZE OF
WIRE CONNECTION



Patented June 8, 1862;
April 6, 1869; Dec. 23, 1873;
Jan. 20, 1874; Dec. 22, 1874;
April 20, 1875.

PAT. DEC. 23, 1873
BLAKEMORE'S GRAVITY DOOR ALARM
USE NO. 3425 MARKET ST. PHILA. PA.
MANUFACTURED FOR
SEND FOR CIRCULAR

WHELPLEY & STORER'S Crushers & Pulverizers,

For ORES, COAL, CEMENT, PLAS-
TER, MINERALS, GRAIN,
Etc., at greatly reduced prices. Pulverized
fuel applied to the puddling and heating of Iron
and Steel.

LEVI R. GREENE, Trustee,

69 Kilby St., Boston, Mass.

GEORGE FOCHT Iron Foundry, Machine & Sheet Iron Works.

First and Adams Streets, Hoboken, N. J.

Inventor, Pat-
entee and Manu-
facturer of the
Celebrated Self-
dumping Hasting
Tubs, Iron, Coal
Cars, side or bot-
tom dumping,
Iron Dock and
Hook Blocks, Iron
Sheaves, with or
without Steel
Friction Rollers
for Chain, Wire or
Hemp Rope, of
every size and de-
scription. Iron Box
Wheelbarrows,
Coal and Coke
Barrows, Charg-
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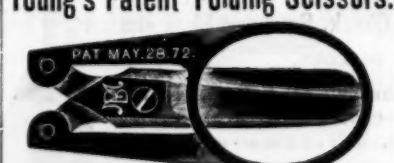
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Fits simile of the small size.

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Set Screws, Bolt Ends, Turn Buckles, &c. Manufactured by

SAMUEL HALL'S SON & CO.,

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Brass Goods at the Centennial.

The display of brass castings, such as steam fittings, ground cocks, self-closing faucets, &c., at the Centennial is very fine. We give below a brief description of some of the principal exhibits in this line:

M'NAB & HARLIN MANUFACTURING CO.

The factory of this company is at Paterson, N. J., and the warerooms at No. 56 John street, New York city. Their exhibit in Machinery Hall is located at B. 41, immediately to the south of the great engine, and consists of three cases. The first in prominence of position has two divisions; the lower or counter one, being entirely open, affords space underneath for the heavier articles. Supported upon columns that are elegantly ornamented with veneered panels, is the upper, or case proper. This is inclosed in plate glass, the corner pillars being formed of beautifully grained, turned and oiled black walnut. The roof is handsomely carved in carved wood, the ornamentations gradually sloping from the centers. Occupying the central and highest position, and being in fine proportion with the rest of the case, is a small, square turret or cupola, embellished with carvings of tasteful designs, and having inscribed upon each side the firm name in plain, neat letters. This case contains samples of all goods necessary for engine fitters and boiler makers, viz., iron bodied globe safety and check valves, both plain and flanged, and of all sizes; brass steam whistles, with and without valves; Gee's patent oil cups, with bodies of brass, and transparent; brass whistle valves, gauge cocks, soft metal and rubber seat valves with stuffing box; globe, angle and safety valves of brass; same in water gauges for locomotives; an assortment of combination water gauges; oil cups with and without cocks, both plain and fancy; pump valves with and without air chambers; foot valves with strainers; steam gauges of all kinds; brass and nickel plated globe and tallow oil cups; radiator valves with ground joints; cylinder cocks with and without couplings; steam test gauges; Broughton's oil cups, lubricators, &c., &c.; soldering nipples and unions; iron bodied three-way valves, plain and flanged; valve lubricators of all kinds; steam bibb and stop cocks, with and without couplings; vertical check valves in brass and iron; Mississippi gauge cocks; gauge cocks, Cuban pattern; wood and lever handle gauge cocks with hose valve to be ground in when on the boiler, flanged hose cocks, &c., &c. The second case is precisely similar to the one already described, and contains a most extensive and varied assortment of rough, ground and compression plumbers' articles, brass beer cocks of all kinds and sizes, compression and ground basin and bibb cocks of all styles, both plain and plated; basin plugs of all kinds, plain and plated; hose pipes and couplings of all kinds, vacuum valves of all kinds, championing cocks of various styles, compression basin and bath cocks, Getty's patent self-ventilating beer cock, rough and finished compression bibb and stop cocks for lead and iron pipes, urinal cocks, all kinds of ground and compression counter and pantry cocks, plumbers' proving pumps and gauges. The third case is of pyramidal form. Upon the sides which are uncovered are arranged a full line of malleable and cast iron fittings for all sizes of cast and wrought iron pipes, consisting of flanges, unions, saddles, and a full line of brass fittings. As will be seen from the foregoing, the dealings of this firm are in valves, defining that word in its broadest sense. Those even the least familiar with machinery will acknowledge that the delicate work upon a valve, and that requiring greatest care, is internal. While all the wares here displayed are ornate in outward appearance, the working portions will bear the closest scrutiny, and may be relied upon by all who desire to purchase such articles. The display attracts universal admiration, both from the mere uninitiated sight-seer, who can only delight in the beauty of the exterior finish, and from the practical scrutinizer, who can judge of and appreciate the delicate accuracy of the interior work. Taken as a unit, the display is neat and varied. The interspersing of the beautifully plated and polished wares agreeably relieves the sober colors of the iron and brass. The quality of the brass and the style of the castings of this firm rivet the attention of all who approach their exhibit, and invariably receive the highest commendation. The closest examination fails to detect any indication of flaw, or even a blow-hole. The house has been established about 25 years, and its justly deserved and enviable reputation is not confined to our own country, but is appreciated in foreign lands, whence many orders are being constantly received. The cases described are in charge of Mr. D. Keith.

COOPER, JONES & CADBURY.

This old Philadelphia firm have a very fine exhibit of their brass and iron work, situated in the main aisle of Machinery Hall, and just east of the great Corliss engine. The space allotted them is in form rectangular, the short side facing the broad passage, where, in a very neat black walnut case, they have placed a complete and varied assortment of silver-plated plumbers' materials of all descriptions appertaining to the finishing of costly basins. Upon the rear of this case is a practical exhibit of water closets designed by the firm. To the right is a basin and fixtures said to be one of the most elegant and complete ever made. There is good, strong ground for believing the assertion. The design is indeed neat and tasteful, while the operation is direct and perfect. The bowl is of marble, of the usual size, and just back of this is one spout only, for hot or cold water, or both, at the option of the one using it. The flow is controlled by cocks placed on either side, instead of the old plan of having a water way for each kind of water. At a convenient height over the center of the bowl is a sprinkler for shampooing purposes, and also

connected with both waters. This sprinkler can be inverted, and will then emit a simple stream. All the metal work connected with the apparatus is silver-plated, and of very superior workmanship. The idea of this single exhibit seems to meet very general favor, and is most certainly a decided improvement upon the old plan of double faucets. In the midst of this exhibit is a large iron fountain in active operation. The basin is 8 feet in diameter, from the center of which rises a column 4 feet high. This forms an attractive feature of the display, both from its tasteful design and the cooling effect upon the immediate vicinity. While we have the thermometer at 102° in the shade, and the cruel Dog Star going over daily with the sun, we may be thankful to any one who provides for cooling the atmosphere. Around this elegant fountain, and very neatly arranged, are globe and safety valves of brass and iron; also steam gauges and whistles of several sizes, together with a large collection of rotary, horizontal and vertical hand pumps. All the work will bear the closest scrutiny, and compare favorably with that of any manufacturer.

JARECKI MANUFACTURING COMPANY.

This company have a display in Machinery Hall replete with their productions. They are manufacturers of brass work for gas fitters and builders of fire engines, and exhibit a large array of steam and water fittings, comprising globe, check and safety valves, both of malleable iron and brass. A specialty of this firm is their pump chambers for oil wells. These chambers are cast solid and bored out, by which process a smoother and straighter hole is secured than it cast with a core. They have adjustable pipe tongs that will firmly grip a pipe of any diameter from one-quarter to 1½ inches, by which the workman is saved from carrying, at least, four pairs of tongs to do the same work. They are readily applied, and it is impossible to derange their working gear. Their display of steam whistles is large, from the shrill toned piccolo to the resonant bass. The goods are all of excellent manufacture, and will bear the closest examination. The works are at Erie, Penn., where they employ a large number of hands, to whom they give constant employment.

UNION BRASS WORKS,

William Powell & Co., Cincinnati, Ohio. This is another company having a display in Machinery Hall. In the center of the exhibit, arranged upon a pyramidal stand, inclosed in a semi-circular glass case, may be found an ornate array of Powell's regrounding valves, in iron, brass and plate; also automatic tallow lubricators. To the left of this are plated and brass cylindrical engine oil cups. To the right are Powell's patent bath, basin and sink plugs, with rubber stoppers. This is considered a device long needed, for while it is as effectual as a ground plug, it will not injure in any way the surface with which it comes in contact. The exhibit is quite attractive, the wares well made, and great skill is shown in the accuracy of the manufacture.

Striking Steel Workers.

The Chicago *Inter-Ocean* gives the following particulars of the recent strike of the steel workers at the Union Rolling Mills of that city: A strike of considerable dimensions occurred yesterday at the Union Rolling Mills, corner of Ashland and Archer avenues, the immediate result of which was to throw over 700 men out of employment. The occasion of the strike was a determination on the part of the workers in the steel department to demand an increase in their wages of from 10 to 15 per cent, which demand being refused they declined to go to work. A general suspension of labor followed, each department in the mill being dependent to a great degree upon the others. The steel workers number 230, and about 450 men are employed in the other departments of the works as laborers, etc. This action on the part of the strikers was resolved upon at a meeting held on Sunday night, so that little notice was given to the company, although rumors of the contemplated movement have been in circulation for a week or so.

The wages earned by the men who have deliberately caused the stoppage of a large industry, and involved in an enforced idleness more than double their own number, ranged from \$2.50 to \$6 per day, the average being about \$4. Last month was the first during which the mills have been run at full time for nearly half a year. During the winter the mills were closed in order that the machinery might be overhauled, and as a natural consequence the employees became short of money, and ran into arrears with their landlords and tradesmen. The superintendent of the works, Mr. James Whyte, states that the wages are as high as those paid by other mills, and claims that he will have no difficulty in filling the places of the striking workmen at the old figures. Prices for rails are now very low—lower than at any time during the past three years—and the reduction in wages which was made last year was absolutely necessary in order to keep the mills running. The Union Mill Company have mills at Kansas City and Newburg, Ohio, for the manufacture of iron and steel, and mines and blast furnaces at Marquette, Mich., so that they will be able to fill the orders on hand without trouble. No demonstrations have been made by the men, and no trouble is anticipated unless an attempt is made by the strikers to interfere with the men who will be engaged in their places. Sergeant Hood of the Deering Street Station, has made every preparation in case trouble should ensue, and a watch will be kept on the works.

The Marquette Mining Journal publishes the following table, showing the total shipments of iron ore from the district this season, up to and including Wednesday, July 6, together with the shipments for a corresponding period last year:

	1875.	1876.
Marquette.....	137,583	139,806
Escanaba.....	74,167	116,679
L'Anse.....	17,589	18,597
Total.....	229,339	274,782

Showing an increase of 45,550 gross tons.

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**Wood Screws, Steel in Sheets,
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1 " " " 7.00 2 1/2 " " " 18.00
1 1/4 " " " 9.00 3 1/2 " " " 15.00
with lower case. 15.00

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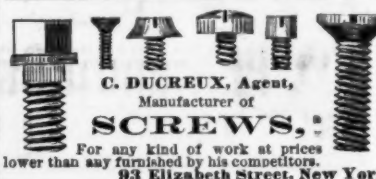
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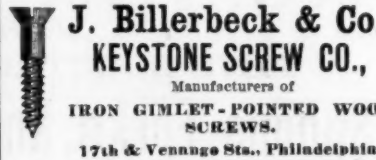
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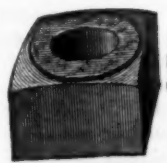
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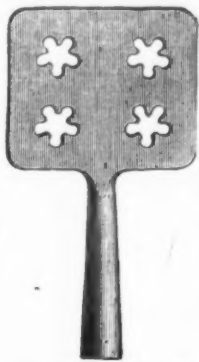
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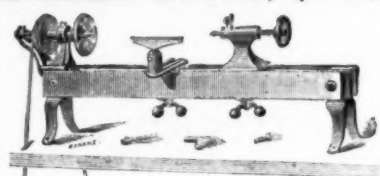
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The Iron Age.

New York, Thursday, July 20 1876

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JAMES C. BAYLES, Editor.
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to enforce this rule in every instance.

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What Shall We Do for Labor.

In our last issue we gave our reasons for
believing that the oft-suggested expedient
of directing idle labor from manufacturing
into agriculture is impracticable. We
shall not go over the argument a second
time, but to refresh the memory of the
reader who has felt enough interest in the
subject to follow us thus far in our discus-
sion of one of the most serious problems
of the time, we will say that the reasons
why this idle labor of towns cannot find
profitable employment in agriculture may
be briefly summarized as follows:

1st. Mechanics as a class are unskilled
in all branches of agricultural labor, and it
must be at least two years before they
could command permanent employment as
farm hands. The demand for large acces-
sions of unskilled labor in the agricul-
tural districts is limited to seasons; the
farmers do not want and cannot employ
unskilled labor by the year; and the
wages which an unskilled man could earn
during haying and harvest would not
enable him to live during the remainder of
the year.

2d. But few, comparatively, of our
mechanics can become farmers with any
prospect of success. A great majority of
those now idle have no capital available
for investment in implements and stock,
and they cannot buy land. Were the
land given them, they could not get
subsistence from it until they had gained
from experience the knowledge which the

farmer must have for the successful raising
of profitable crops. Half the idle
mechanics in New York, Philadelphia or
Pittsburgh to-day would starve to death on
farms of their own, unless they had some-
thing to draw upon until they had learned
the business of farming.

3d. The idle labor of towns will not go
into the agricultural districts to seek em-
ployment. They prefer town life, and
will resort to any expedient to find sup-
port rather than venture upon a new and
untried life which has no attractions for
them. We cannot say their choice in this
matter is not wise.

4th. They have not the means to trans-
port themselves and their families and se-
cure homes in the agricultural districts
where labor is wanted.

5th. The stagnation in manufacturing
is, we think, only temporary, and our
skilled labor will all be needed in manu-
facturing during the next ten years. It is
better to keep the skilled labor we have
than to experience the want of it in the fu-
ture.

We consider these good and sufficient
reasons for believing that those who assert
that there can be no return of general
prosperity until there has been a great di-
version of labor from manufacturing and
the distributive industries to agriculture,
are mistaken.

In our judgment, the question, "What
shall we do for labor?" is one for which
an answer must be sought in the localities
in which labor now stands idle. It would
be very pleasant, temporarily, for the
towns if they could get rid of all the idle
poor now clamoring for relief, even though
the agricultural districts were overrun
with them as "tramps;" but the burden of
providing food or employment for this
class would ultimately fall somewhere,
and if the country districts were compelled
to carry it in summer, it would fall doubly
heavy upon the towns and cities in winter.
No thoughtful person could desire to see
this exchange of pauperism between town
and country carried on to any greater ex-
tent than it is at present, and unless the
diversion of labor from the manufacturing
into the agricultural districts can be made
permanent—or, at least, until the demand
for labor skilled in the arts shall again ex-
ceed the supply—we shall only make a bad
matter worse by encouraging it at all.

As we have before said, each locality
with a present surplus of labor must, so
far as practicable, provide for it at home.
How can this be done? Obviously the
answer to this question must depend upon
local conditions. What would be practic-
able in one case might be wholly imprac-
ticable in another, and no suggestions
could have any value except the most gen-
eral. All that we are prepared to offer at
this time may be briefly stated as follows:
1st. All persons in a position to employ
labor should give employment to as many
as can be made use of. In times like these,
idle workmen deserving of help will not
expect the wages they have earned in more
prosperous times, and special arrangements
can be made for almost any kind of work
at wages which, while keeping the work-
man above want, will enable the employer
to secure his services on very favorable
terms. Every citizen should consider it
his duty to do what he can in this matter,
even though his efforts do not result in
immediate profit to himself.

2d. Manufacturers should—and, we are
glad to say, generally do—regard it as a
moral obligation to assist their work peo-
ple to the limit of their ability. It is the
manufacturer's interest to keep his skilled
mechanics together, and to promote as far
as possible their welfare. He should at
this time offer employment to as many as
he can use, at such rates of wages as he can
afford. If any alterations or additions to
his works are needed, or any improvements
to his property can be made with advan-
tage, he could not do better than under-
take them at this time. It will be a long
time before materials and labor can be had
so cheaply as now, and the loss of interest
resulting from anticipating his actual
requirements will probably be compen-
sated by the saving in cost.

3d. There are a great many necessary
public works which should be undertaken
now as a means of employing labor. There
are both State and local enterprises con-
templated which must be undertaken
before many years, and which can be car-
ried out very much more cheaply now than
in times when labor is in greater demand.
Were these undertaken now they would
give employment to a great many men
whose families must otherwise be a burden
to the public during the coming winter.
An increase of public expenditure upon
public works at this time would be better
than what otherwise seems inevitable, an
increase of pauperism.

4th. The idle mechanic who cannot find
employment at the work he prefers,
should be encouraged by the press and
public sentiment to do whatever he can

get to do. In finding employment, per-
sonal effort is the only sure dependence.
A great many more men can make a living
in any community than there seems room
for, and those who set about finding em-
ployment of some sort can generally
manage to pick up a subsistence which is
better than dependence upon public or
private charity. These remarks do not,
of course, apply to the indolent, the in-
competent or those whose vicious habits
make them the objects of public dis-
trust. Nor do they apply to the partisans
of the trade unions who quarrel with
their daily bread, and not only refuse a
half-loaf when it is offered them, but in-
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make them the objects of public dis-
trust.

It may be said that we have offered no
practical suggestions for the relief of labor.
If not, it rests with the public spirited and
philanthropic citizens of the different sec-
tions in which labor stands idle to devise
other and better means of relieving the
working classes than we have been able to
suggest. All that we have attempted to
show is that employment for idle labor
must be found where that labor exists, and
that it is worse than useless to say to the idle
mechanic, go and engage in farming. Pos-
sibly some labor drawn from the agricul-
tural districts by the pleasanter and more
profitable occupations of the towns may
return to agriculture with advantage; but
no general and immediate redistribution
of our labor supply is possible. We must,
for the present, provide our workmen
with employment where they are, and the
means to that end will be the means by
which we shall best and soonest promote
a return of general prosperity.

The Advance in Tin and Tin Plates.

The recent recovery in the value of tin
in the London market, at a time of ex-
treme depression in the general metal mar-
kets of Europe, is of sufficient interest to
invite a closer examination of the statis-
tical position of the metal, which is shown
in the following tables:

STOCK OF TIN IN EUROPE.

	Jan. 31, 1876.	June 1, 1876.	June 1, 1875.
Tons.	Tons.	Tons.	Tons.
Banca on warrants	1,390	460	963
Banca Trading Co.	1,658	2,310	2,349
Billiton	875	902	705
Straits and Australian at Lon- don.	6,038	7,470	5,866
Total	9,961	11,142	9,883

AMOUNT OF TIN AFLOAT FOR EUROPE.

	Jan. 31, 1876.	June 1, 1876.	June 1, 1875.
Tons.	Tons.	Tons.	Tons.
Banca	431	375	716
Billiton	1,000	950	600
Straits	622	520	630
Australian	2,438	1,500	1,100
Total	4,791	3,325	3,046

Between the stock and amount afloat,
the total visible supply was therefore
14,440 tons on the 31st of January of the
current year, against 14,467 on June 1st,
and 12,929 on June 1, 1875.

The stock on warrants in Holland had
declined to a low figure, being less than
one-half the amount held a year ago, but
the company held for its own account
nearly as much as it did then. Billiton
had increased a little, while the London
stock remained as large as ever. As for
the amounts afloat, that of Banca was be-
ing kept unusually low, but Billiton was
still largely in excess. Straits afloat
showed a serious decline, while Australia-
n was still considerably ahead of last
year, but 900 tons less than on February 1.
On this decrease in the shipments afloat
from the Straits and Australia, in all 1325
tons compared with February 1, the better
feeling mainly rested, although the total
visible supply had not improved statisti-
cally, being as unwieldy as it was then.
The shipments from the Straits to the
United States had, meanwhile, decreased
materially, being but 12,850 piculs during
the first four months of the present year,
against 22,594 in 1875. While the position
of the metal in Europe shows no greater
strength, from a statistical point of view,
it has vastly improved on this side.

There was, however, a prospect that
shipments, both from the Straits and Aus-
tralia, would remain light during some
months to come, and that the fair deliv-
eries that were being made would be instru-
mental in at length bringing down the
London stock to a more manageable
figure—the more so as the Dutch Trading
Company, after disposing at current
market value of a large accumulation
previous to the 1st of June, had less in-
ducement to press sales at the approaching
July auction.

Meanwhile the production of Banca and
Billiton tin is about as large as ever:

BILLITON PRODUCTION.

Piculs.	Piculs.
1866.....15,319 1871.....47,319	
1867.....25,043 1872.....40,850	
1868.....32,970 1873.....54,507	
1869.....30,316 1874.....51,084	
1870.....36,166 1875.....62,000	

This year it is estimated to show an ex-
cess on 1875. In ten years, it will be
seen, the supply from that quarter has
quadrupled.

The stock of Banca at the mines, Janu-
ary 20, 1876, was 34,500 piculs, at Batavia
41,500, and at Sourabaya 2000; together
78,000, of which in all the present year the
Dutch Trading Society will ship to Hol-
land 50,000 piculs. The yearly Banca pro-
duction is valued at present at 65,000 to
70,000 piculs. Assuming, then, that Billi-
ton and Banca produce together 130,000
piculs, or about 8000 tons in 1876, it will
be observed that there will be no falling
off from that quarter, the production hav-
ing been 7925 in 1875, 7306 in 1874, 7335 in
1873 and 6149 in 1872.

As regards prices, we can only say they
have declined to a very low figure this
year, £71 for Straits, from which there has
been a gradual recovery to £73. 10/.
Should the deliveries in England and Hol-
land continue on the same liberal scale as
heretofore this year, and large shipments
from the Straits and Australia not be re-
sumed soon, we may look forward to a
further appreciation. In this market
there are elements which favor an ad-
vance of prices. Neither consumers nor
the trade hold an ample supply, and the
falling off in our imports from the
Straits can hardly fail soon to make itself
felt, unless we counterbalance it by a larger
importation of English, which, in its turn,
would lend additional strength to the
London market.

In the meantime tin is benefited in no
slight degree by the sudden and important
improvement in tin plates, both in Eng-
land and here, the price there having ad-
vanced between 1/ and 1/6, and here in
many cases 50c., gold, per box. We have,
we believe, abundantly shown, in former
editorials on tin plates, that the article de-
served the attention of consumers at the
extremely low figure to which it had de-
clined. The upward turn now seems to
have arrived, without the prospect of a
succeeding decline, as has been so often
the case on former occasions. It will now
depend on the stocks held inland; if mod-
erate, as it is presumed they are, a further
gradual appreciation may ensue. At all
events, it is an encouraging feature when
large banking firms at London, as we are
assured by mail, consider tin and tin plates
cheap enough to invest spare funds in
while the extreme ease in money lasts.

How England is Losing Her Export Trade in Iron.

A careful review of the current literature
of the iron trade of Great Britain will
show that our English neighbors, who are
disposed to growl on slight provocation,
have something very tangible to growl
about in the present condition of affairs.
The depression so general in this country
is even more general in England, and the
percentage of failures in the iron trade
among old concerns which were counted
well established, has been even greater
than here. The condition of the ex-
port trade is especially unsatisfactory, and
one by one the best and most profitable
foreign markets are being closed to British
iron by a competition with which the
British makers cannot profitably compete.
The American trade they count as lost, and
the false hopes of a revival in the Ameri-
can demand, based upon the expectation
of a reduction in the tariff, have been so
often disappointed that but few who have
any active interest in the subject longer
entertain them. Our capacity for the pro-
duction of good iron is so great that, un-
der all probable conditions, the supply
will be fully equal to the demand for sev-
eral years to come, and the price of Ameri-
can iron so low that foreign iron—except
certain special grades for special uses—
will not be likely to come here in quanti-
ties great enough to disturb the market.

But the loss of the American trade is
only one item in the British iron-master's
bill of complaint. His whole export trade
rests upon a very precarious foundation,
and is liable at any time to suffer serious
and sudden diminution. It cannot be
said to be drying up, but it is shrinking
steadily and, in some departments, rapidly.
Belgian competition is felt not only in the
home, but in all the Continental markets,
and there are few large markets anywhere
where there is not some home production,
induced by the high prices which iron
commanded previous to 1873. The latest
and perhaps most serious menace to the
iron trade of Great Britain is the
danger which now confronts them of los-
ing the Russian market for railway iron,
and heavy iron and steel work. The *Iron-
monger*, commenting on this new danger,
says:

The Russian government is doing its best to
foster the manufacture of rails by native

makers. It is understood to have been or-
dained that in future a duty shall be imposed
upon all imported rails; that all concessions to
Russian railway companies shall contain a
clause compelling them to use not less than
one-half rail of Russian manufacture, and to
allow a premium to home rail manufacturers.
But the government has not stopped here. She
would, indeed, seem to be intent upon securing
for her native manufacturers a complete mo-
nopoly in the rail trade. Such traders are to
have specially low rates for the carriage alike
of ore, fuel, pig iron and the finished rails.
With these advantages, and with the very low
wages that prevail in that country, Russian
rail makers will undoubtedly get much of that
advantage over foreigners which the Emperor
Alexander II. intends they shall have. It is
stated that, encouraged by these concessions,
the engineers and tool makers in Russia are now
moving with a similar object, and their pros-
pects are not discouraging. Meanwhile there
seems no little reason to assume that, aided
in this way, iron and steel production in Russia,
together with native engineering, will be more
vigorously prosecuted than heretofore. The
demand for fuel will correspondingly increase,
and those districts where coal is being mined,
and those also which promise the finding of
fuel, will be more carefully searched. Even as
the concessions to the Russian rail makers will
not work to the advantage of the British
maker, neither will it materially help the Brit-
ish coal owner; for the Germans, we fear, will
be only too glad to make up to Russia any de-
ficiency in her native coal supply. All this, fol-
lowing closely upon the loss of our United
States rail trade, is cause for much serious con-
sideration, to be followed by spirited com-
mercial enterprise in new directions by engineering
and rail making firms at home. It is to be as-
sumed that the British Iron Trade Association
will do its best to reduce these protective
clauses to a point at which some chance will be
left open to English producers. In such a
movement we wish the Association as much
success as it is generally believed will attend
its movements relative to the not dissimilar
New French treaty. But this is doubtful.

We quite agree with the *Ironmonger* that
the success of the Iron Trade Association in
shaping the tariff policy of foreign gov-
ernments against the interests they seek to
foster by protection, is extremely doubt-
ful. British anxiety for the repeal of the
American tariff has done more to
strengthen and sustain the popular ap-
proval of protection as a system than any-
thing else. Their policy would have been
to wait quietly until such changes were
made as would be to their advantage, and
then seize the benefit. But in their im-
patience to regain lost trade they have so
loudly proclaimed the advantages of a
lower tariff to British producers, that all
who are engaged in manufacturing have
taken alarm. The same will be true in the
case of Russia. The organization of an
Iron Trade Association with the avowed
purpose of promoting such changes in the
commercial laws of foreign countries as
will benefit English iron makers, is an act
which savors strongly of impudence, and
the failure of such an association to ac-
complish its object need not excite any
surprise. The American citizen may have
his own opinion of the wisdom of
protection as a policy, but however
he feels on this subject he will re-
sist any attempt to influence our
legislation in the interest of foreign man-
ufacturers. When we are ready to change
our tariff we will do so for reasons of our
own.

The Value of a Contract with the Boilers.

Our readers will remember that some
weeks since we characterized the so-called
contract which the boilers of Pittsburgh
were asking the manufacturers to sign, as a
farce, as not having the first essential of
a contract, as being of no legal nor bind-
ing force, and one that might be broken as
circumstances should indicate, just as the
boilers had in the past broken other con-
tracts they had made. With an exuber-
ance of rhetoric the *Labor Tribune* asserts
that the contracts made by the boilers have
been kept as religiously as though written
on tablets of gold (though why "tablets
of gold" make them more binding than
the brass ordinarily used in writing them,
does not appear), and desires us to show
when they have violated them.

This is a very easy task. They violated
the contract made at the end of the long
strike, the one that was ended at the be-
ginning of the lockout of November, '74,
and it was the violation of it that caused
that lockout. It was again and again as-
serted by the manufacturers during the
conferences that preceded the lockout, that
it was distinctly agreed at the time the
scale was made that, when iron reached or
went below 3c., there should be a read-
justment of the scale on a lower basis.
This assertion was not denied by the boil-
ers in a single instance. It was rather
confirmed by their speeches, and yet they
persistently refused to keep their contract.

Again, when this lockout was settled,
and the men went to work on a contract,
that contract was between the mill owners,
and the boilers employed in their mills,
and any trouble was to be settled between
them. It was distinctly understood that
the Union had nothing to do with settling
future troubles, and yet the first trouble
that arose the boilers in the several
mills refused to treat with the mill owners
and referred them to the Union, thus break-
ing their contract.

Again, there were mills in Pittsburgh at
the time of the strike of June 1st, that had
positive contracts with their men that, if

case of a strike at Pittsburgh, they were to continue to work if Wheeling did, and they did so for a day or two, but were forced to break their contract and repudiated it without hesitation.

We could enlarge this, if necessary, but it is not. We assert that not only have the boilers persistently broken contracts they have made as individuals, but as a Union, and they have never kept one and never will, when an opportunity comes to break it to their own advantage and they feel strong enough to do so.

Composition of Flue Dust.

We give on another page a paper read by Mr. J. Blodgett Britton before the American Institute of Mining Engineers, on "The Composition of Flue Deposit." We invite attention to it, as it is worthy not only of the most careful study by every practical iron master, but also of further elaboration which Mr. Britton is so well fitted to give it.

So far as we are aware, these are the first analyses made of the flue deposit of anthracite furnaces, though some have been made of that from coke furnaces, which Mr. Britton intended to include in his paper, but did not. Any of our readers who desire to compare these analyses with those given in Mr. Britton's paper, can find them in "Crookes' & Rohrig's Metallurgy," page 605; "Bauer's Metallurgy," first American edition, page 230; and "Bell's Chemical Phenomena," page 146. The most noticeable feature in these analyses is the amount of potash, which varies from 1.80 in a Dowd specimen to 40.00 in one analysed by Mr. Britton.

The most important part of the communication, however, is that giving the results of the analysis of flue dust from puddling and boiling furnaces. These are, so far as we recollect, the first published, and show an astonishing amount of phosphorus. They also show that, contrary to the generally received idea, a large amount of phosphorus is volatilized in the process of puddling and boiling.

The Nail Trade.

We congratulate the Nail Manufacturers on the complete union effected last week between the Eastern and Western nail associations, and take advantage of the occasion to express the wish that the days of the senseless and indefensible raiding each others' territory is gone for ever. The basis of the agreement between the two associations is simply an arrangement to sustain the prices each may establish in its own territory. The East, when selling West, is to maintain Western prices, and vice versa. In all other respects they are independent, in organization, officers, establishing prices, and, in fine, in all matters of internal economy.

This is a source of congratulation, not only to every nail manufacturer, but to every consumer as well. It guarantees a fixed, definite price at which all, purchasing in the same quantities, can buy. A dealer or consumer knows that his neighbor or rival must buy the same that he does; and he can buy and sell with a confidence that he has not known for many a day. And the manufacturer; what a relief to him! He has been in the position of virtually refusing to sell to two buyers, equally good financially, and as customers, at the same price. Some makers have been so ashamed of the position that they have refused to sell, except at the one price, and have lost trade thereby.

Now, there is one more "consummation" devoutly to be wished, and that is that the Eastern and Western iron associations may go and do likewise. There is every reason why they should, and none why they should not. Self-interest prompts it, the safety of investments in rolling mill property demands it, and the welfare of the iron trade will be promoted by it.

"Half Made" Pig Iron.

The *Labor Tribune*, following the direction of its wonderful genius for getting at the gist of the matter, has made a discovery. It is this: "The boilers are now kept at work long hours on half made pig iron, because it is hurried through the blast furnace."

We do not know as we should credit this paper with the brilliant discovery that pig iron hurried through the furnace—meaning by that, pig iron made at times when furnaces make large runs—is half made. We believe that Mr. Harris, the ex-president of the Boilers' Union, is entitled to the honor—at least, we heard him so assert some two years ago, claiming that it was so impure that the boilers had to go round on their hands and knees scraping up dirt to throw into it to make it boil. That is, it was so impure that more impurities had to be thrown into it to make it work.

The fact is just the opposite of what is as-

serted by the boilers. We cannot say anything about the ease of working, but no fact is better established than that the best iron our furnaces make is tapped when they are making large runs. The openest, grayest and by far the purest iron the Isabella Furnace, at Pittsburgh, ever made, was when it was averaging over 100 tons a day, and the most surprising point was its uniformity. Scores of analyses from a pile of 3000 tons, showed no more variation than would be due to errors in the quantitative determinations. The idea, that by reason of the rapidity with which the stock descends, there will be raw or half smelted ore with the pig is absurd and contrary to all reason and experience.

Chamero's Weighing Machine.

A communication was recently made to the Society of Civil Engineers, Paris, concerning this invention, by which a weighing machine of the steel-yard type is made to register the weight ascertained, by printing it on tickets during the operation of weighing. This is accomplished by arranging at suitable distances along the under edge of the scale beam a series of punches, like those for stamping names or figures on wood or iron, with projecting figures; in a machine for weighing up to a thousand kilograms—about a ton—these figures represent hundreds. A movable plate is inserted in the sliding weight below the beam, and capable of being brought into contact with it by a lever. The ticket is introduced between the plate and the under edge of the beam through an aperture in the sliding weight. These figures print the hundreds; but the tens figures following by a line are set on the under side of a short bar which works in the sliding weight like the bolt of a door. The tickets having been already printed with equidistant spaces numbered to represent the units and divided by dots, when an article has to be weighed, the sliding weight is brought under whichever hundreds figure corresponds to the nearest approximation to the weight, and equilibrium is obtained by moving the short bar, previously mentioned, from left to right in the sliding weight. The ticket is then inserted between the movable plate and the beam, and a smart blow on the lever punches the tens and hundreds figures on the tickets, the position of the horizontal line following the tens figure with respect to the dot and line already printed, permitting of the weight being ascertained and printed correctly to a quarter of a kilogramme.—Jb. The advantages of this invention, as pointed out to the meeting, are: The permanent register afforded; the greater facility of reading the weight from a printed ticket than from the scale beam, which fatigues the eyes and requires the services of a man accustomed to reading off weights; the ease with which the weighing may be supervised, as it is only necessary for the inspector to see that equilibrium is established, and there being beside an arrangement which prevents any printing taking place except during equilibrium; and, lastly, the affording of one or several tickets bearing the weights, which may accompany the consignment note. There is also this additional advantage of the test afforded of the correctness of the different machines, on a railway for instance, by which the same goods might be weighed.

A matter involving a question of considerable importance to railroad companies is soon to be judicially decided in Pennsylvania. Recently H. L. Taylor & Co., of Petrolia, the largest producers of petroleum in the oil regions, leased a narrow strip of land from the Erie Railway Company (about a hundred feet wide), extending along the line from Carrollton. The terms of the lease were somewhat peculiar, the lessees not only paying a large royalty, but binding themselves to indemnify the railway company for any loss resulting from fire at the wells to the track or rolling stock of the company. Soon after the lease was secured, H. L. Taylor & Co. put up two rigs on the leased property, proposing to develop it at once. This proceeding gave considerable dissatisfaction to a number of the producers here, who applied for a preliminary injunction before a judge of the Supreme Court, in chambers, who granted the application, restraining the defendants from further developments on the lease until the case comes up for hearing before the court at the August term. Work has consequently been suspended at the new wells. The complainants allege that the Erie Railway has no authority under the statute to lease lands for the production of petroleum through which they have merely been granted a right of way.

The tramps are said to be going westward, though without apparent object. A Davenport (Iowa) special of the 7th says: "During the last few days tramps have captured trains on the Rockford Road, and compelled the engineer and conductor to haul them from Monmouth and Bearshead to Rock Island and Moline, from which points they make their way to this city by the government bridge. Over 600 have arrived here within 24 hours. A dispatch received here to-day from the general passenger agent of the Rockford Road states that 500 more are coming. The mayors of Rock Island and Moline have issued proclamations calling upon the citizens to act."

On the 11th instant the Molders' International Association, in session at Cleveland, Ohio, elected the following officers: President, William Saffin, of Cincinnati. Vice-presidents, John J. Grace, of Albany; Francis Sullivan, of St. Louis; John Nolen, of Toronto; and Dennis Guno, of San Francisco. Secretary, M. F. Hayburn, of New York; and treasurer, P. J. Meaney, of Brooklyn.

THE BUSINESS OUTLOOK.

Failures for the First Two Quarters of 1876.

The figures of failures in business, all over the United States, for the first two quarters of the year have been forwarded to us by the Mercantile Agency of Messrs. R. G. Dun & Co. The total for the past six months, as compared with same period of last year, is far from reassuring, as the following will show:

	First quarter.	No.	Amount.
1875.....	1,982	1,982	\$43,000,000
1876.....	3,806	3,806	61,000,000
	Second quarter.	No.	Amount.
1875.....	1,581	1,581	33,000,000
1876.....	1,794	1,794	43,000,000
	Six months.	No.	Amount.
1875.....	3,563	3,563	76,000,000
1876.....	5,600	5,600	104,000,000

This shows a startling increase, both in the number of failures and amount of liabilities for the six months just concluded, but attention is drawn to the fact that this increase mainly occurred in the first quarter of the year. Although the figures for the three months just closed are somewhat larger than those in the corresponding quarter of 1875, there is a marked decline in the figures for the second quarter of the current year. In other words, the number of failures in the last three months are less in number by 1000 than in the preceding three months of this year, while the liabilities show a decline of \$21,000,000, both items showing an improvement of over 40 per cent. This variation is greater than ever before in the same period, and, happily, in this instance the variation is in the right direction. It appears from the circular before us, that the average liabilities of each quarter in the past 18 months are \$51,000,000; so that the liabilities of the quarter just closed (\$43,000,000) are \$8,000,000 less than the average.

From these figures, the Agency is inclined to encourage the belief that we have seen the worst effects of the present depression, so far as failures are concerned. The circular says:

"It is true that business continues in a very depressed condition; that the results of trade, with rare exceptions, have been exceedingly unsatisfactory; that values continue to decline, and that uncertainty and anxiety exist in all quarters. Yet in the face of all this, there is comfort in the reflection that the causes which produced this condition of things have been almost completely reversed. In the place of reckless overtrading, we have now lessened sales guided by caution, and also prudence in purchasing. Instead of enormous overproduction of all descriptions of manufactures, there is now the strongest tendency to limit the product, and thus lessen the possibility of a still further decline in prices. Vastly increased expenditure on public works has been succeeded by the almost complete cessation of construction. Economy in business and personal expenses has taken the place of a very large extent of extravagance and reckless liberality, and this very tendency, while it is the cause of a restricted business, is one of the best signs of an early return of prosperity. So that in all departments there is evidently a change, and such a change as it was necessary for the three years of depression to produce, and without which it was hopeless to expect a revival of business on a sound basis. Having reached this condition, there is not ground for hope that a better state of things may now prevail? It would be idle to expect that very marked improvement will be evident in the immediate future. Things have reached too desperate a state to permit such a hope. The circumstances of an exciting political campaign are not favorable to the growth of confidence and the return of business to its wonted channels. But the coming autumn will, it is believed, afford hopeful indications for the future. Another year of great productive power has been given to farmers and planters, and the country must be greatly enriched by the realization of the agricultural wealth which it now enjoys. Internal indebtedness is not excessive; stocks of goods in all quarters have seldom been so small; prices have touched a point so far below cost of production, that an improvement in value can hardly fail to take place, and it seems impossible that circumstances could exist more favorable to improve the condition of the legitimate trade of supplying the wants of the people, than now prevail. Speculation, and expanded operations involving large and permanent investments, are not likely to receive much encouragement. But there ought to be an increased demand for goods of necessity and merit, and with this should follow better reports of the condition of the various parts of the country than we are now able to present. The power of absorption by a vast people in condition to purchase and pay for merchandise is very great; that power has reached its lowest exercise now; yet, as will be seen, we have had less failures in the last three months than for the previous quarter, and the fact that there are many signs of a more hopeful condition of business is undeniable."

The Bankrupt Law, as it at present stands, is charged with largely increasing the failures, and with Congress rests the responsibility of failure to meet the strong demand which exists in the mercantile community for either an amendment or repeal of the law. The circular before us says:

"In its present shape, the law could scarcely have been more cunningly devised to help a dishonest trader swindle his creditors, and the failures have been largely increased in consequence of its operation. While the disposition to encourage settlements and compromises has been less evident, there is still too great a laxity in the investigation as to the causes of failures, and doubtless a large number have occurred for the direct purpose of making money thereby. The necessity for rigid scrutiny in all circumstances attending a suspension was never greater. The moral tone of business, success of the deserving, and punishment of would-be swindlers, call for the best judgment of creditors, while the task of riding the trading community of incapables, and reducing the excessive number who now divide up a limited trade, until there is no profit for any, is one of the highest duties each merchant and banker owes to the prosperity of his country."

The circular contains returns from the leading centers of business, also the condition of trade, promise of crops, etc., some of which are very sensible and encouraging; others pointless and vague.

It is a significant commentary upon the change that has taken place in the supposed wealth and resources of the mercantile community, that Messrs. R. G. Dun & Co. have under consideration a change in their key to ratings, or estimates, by which those ratings will be made to conform to the large shrinkage in values everywhere apparent. In other words, so great and general has been the decline in

assets of all kinds, that it is proposed to reduce the Agency estimates from twenty to twenty-five per cent. throughout.

The following is an abstract of the returns above mentioned:

ST. LOUIS, MO.

Conservatism in trade hereabouts has been gradually asserting itself in all branches, since the reverses of 1873, and may now be said to be the rule. Credits are more closely scanned than ever, and expenses are getting to the minimum. It is satisfactory also to observe that, although the margins of profit are much smaller than formerly, the volume of business has shown no diminution, and the general condition is believed to be notably better than at the time above mentioned. If nominally worth less, we are practically better off, with fewer liabilities and more actually available assets. The fair average crops of last year give promise of being supplemented by a still greater abundance from the harvest now in progress. At the same time, we have no idea that any immediately perceptible increased demand for goods can be looked for. The lesson of the past few years has been thoroughly learned, and with the ready facilities for "sorting out" that now exist, supply will likely hereafter continue to wait upon demand. Speculation is sick unto death, and should have no mourners at its funeral. Some failures continue to occur among us, but we can point with pardonable gratulation to the statistical count, both in number and amount, of the Missouri and Kansas totals, as compared with those of other equally populous and well favored regions. With a fair system of bankruptcy, even these moderate figures might, it is thought, be made less. Generally speaking our commercial position is as sound, with some few exceptions, as it ever was.

CHICAGO, ILL.

We have had as yet but few indications of revival in business. The depreciation in prices necessitates a larger volume of sales by 10 to 15 per cent. to aggregate the same amount as in the preceding year, the volume of trade showing a slight falling off from last year's business. The trade of the center is considered in a healthy condition. The system of "weeding out" the poorer classes of customers has been steadily going on, reduction in profits deterring houses from accepting the usual average of risks. The returns from the country predict a crop equaling last year's in quantity, and surpassing it in quality. The spring trade in the country came in very quietly, and was spread over a longer period than usual, and a fair amount of goods was sold. The city retail trade has been very dull, but is gradually recovering from the overstocking—both in amount of goods and number of traders—that followed the fire. As a wholesale and manufacturing center, Chicago is more than holding her own, her position being now recognized as a leading "distributing point" for the Northwest. A good fall trade is fully expected, based on the amount of grain to be shipped, with the prospect of good prices being realized for the same, thus bringing a vast amount of money into this section of the country.

DETROIT, MICH.

The results of business during the past six months, considering the times and depreciation in values, is regarded as satisfactory, and when compared with the previous six months and the same period last year, more goods have been sold, but without corresponding profit, and therefore no marked improvement in the trade. Collections have improved with some, but while the average has only been fair, the liabilities of country dealers have been reduced rather than increased. Stocks in the city are about the average, but much lighter in the country, owing partly to jobbers curtailing credits, and careful dealers buying as little as possible. The reduction in prices, varying from 10 to 20 per cent., of course depreciates the value of stocks on hand bought previously. Crop prospects are much beyond the average, but the value will not be materially increased, owing to present low prices. Trade prospects are considered fair, but business will be done on a safer basis.

ST. PAUL, MINN.

The result of the past spring business at this point, on the whole, may be called satisfactory; for although on staple goods the margin of profit was small, the volume of sales was in excess of those for the same period in previous years. Collections, as a rule, are better than the average, and losses by failures light. At present, the prospects for the fall appear good. The country returns throughout the State, with a few exceptions, report "crops looking well," and, barring accidents, the yield will be a large one. Dealers generally, in this State, are in pretty good shape, have purchased lightly, and are being "carried" to a lesser amount than hitherto. The prevailing impression amongst our jobbers is hopeful, and a fair demand for all kinds of goods is anticipated for the coming season.

CLEVELAND, O.

There is little reason to hope for any improvement in trade for the coming season. All branches of manufactures are to a great extent in a paralyzed condition, those in operation producing only sufficient to satisfy the demands for actual consumption. The coal and iron industries continue depressed, yielding but little if any profit to the producer; neither is there any indication of improvement in this respect, or hope that there will be, until confidence is restored, and capital now lying idle seeks investment in new enterprises. Although the crops promise an abundant yield, fully equal to that of any previous year, prices range very low, and, by farmers, are regarded as unremunerative, causing them to hold over for better returns. Merchants are carrying no more stocks than are actually required to supply the wants of the trade, and are not looking for any improvements in business for the coming season.

CINCINNATI, O.

While Cincinnati is thought to be the soundest city of its size in the United States financially, it has not had anything like the usual spring trade, and prices have been so low in a great many lines of business to make it nearly impossible to realize any profit. There are well-founded hopes, however, of doing a fair fall trade. Crops so far promise a good yield; money is plenty, and, with anything like a moderate business, our merchants will be able to make some money, or at least hold their own.

TOLEDO, O.

With the exception of a few houses, the trade this year has been unsatisfactory. The crops in this vicinity are suffering from too much rain, but prospects are good for an average yield. The country merchants have a large portion of their capital in outstanding accounts, and from the very low prices of produce of all kinds, farmers are unable to repay them with ease or rapidly. The desire to visit the Centennial will induce much of our local trade to buy in Eastern markets, and thus, with the usual drawbacks of a presidential campaign, make the prospects for the fall trade rather discouraging.

INDIANAPOLIS, IND.

The spring trade in this vicinity was light, but not altogether unsatisfactory. The outlook for the fall trade is favorable. The growing crops promise well—especially corn and oats. Our merchants have been acting with extreme caution; there has been a general "weeding

out" process carried on here for the past year; unusual conservatism in the granting of credit has been the rule, and the result has proved beneficial. Indebtedness is light and business affairs well in hand. The universal feeling here is that, with the presidential contest settled, and the currency question disposed of, a return to general prosperity would not be far in the future.

DUBUQUE, IOWA.

Jobbers here have had very moderate spring business, and present stocks are light. Collections have been fair, and genuine failures in this section not in excess of those of previous years. While prospects for the fall trade are not flattering, it bids fair to equal, if not exceed, that of last fall, which, on the whole, is not discouraging.

SAN FRANCISCO, CAL.

So far, the volume of trade has been lighter than for the corresponding period of last year, and not so satisfactory, profits having been less and collections very slow. Most of the country dealers began the year more in debt than usual, and as both wool and sheep, upon which a large part of the country depends for money until the harvest, have been ruinously low, the producers have been short of money, and unable to pay country dealers, who have in consequence been dragging all through the season. The mining districts have, however, been prosperous, and the trade of the Pacific Coast, as a whole, is believed to be in a sound and healthy condition. Stocks of country dealers are unusually light, and the prospects appear excellent for a large and satisfactory fall trade, and a general paying up of past due accounts.

PORTLAND, OREGON.

Our spring business, though scarcely reaching the anticipations of merchants in general, has not been altogether unsatisfactory, and some houses inform us that they have enjoyed a much better trade this season than in a corresponding time last year. Our winter rains have been unusually protracted this year; farmers have been very backward in planting, and business has suffered to a considerable extent by floods; but, under favorable circumstances, Oregon will be blessed with a bountiful crop, and money will, in consequence, be easier. Our merchants, therefore, confidently look forward to a more prosperous fall season.

LOUISVILLE, KY.

The state of trade during the past year in this city and vicinity has been, and is now, very unsatisfactory. Collections have been in the main difficult, and our merchants have, on the whole, made no money during last year. The failures for the past six months show an increase, compared with the corresponding six months of 1875, of more than double, both in number of failures and in amount of liabilities. A careful and painstaking canvass among our most conservative business men shows that they really look for no immediate improvement in trade. Some, however—and to whose opinion great deference should be paid—consider the outlook as more favorable, and base their opinions upon the "weeding out" process that has been so manifest around us.

MEMPHIS, TENN.

Heretofore cotton, the staple crop of this belt of country, has been produced upon borrowed capital. A great change in this respect has now taken place, resulting from the impossibility of obtaining credit, owing to the commercial prostration which has so generally prevailed. Unable to get their supplies of breadstuffs, meat, corn, &c., from Northern sections without money, the planters, who hitherto devoted their exclusive attention to cotton, have become producers of these articles. The consequence is that they are in a position of comparative independence, and able to live within their own resources; and they can produce cotton, which, even at present low rates, will clear a fair profit. There is, therefore, a better state of things apparent in this section, and our merchants are encouraged in the belief that consumers are in a much improved position to absorb and pay for goods. The crop prospects from all parts of the country tributary to Memphis are also especially cheering. Wheat has been an average crop, though damaged somewhat by rust. Cotton and corn never were so promising, while cattle, mules, hogs, &c., are numerous and healthy. The consequence is that, whatever may be the eventual result, it is impossible to deny the existence of a much improved condition among producers, and it is fair to presume that trade will be safer and more satisfactory than heretofore.

NASHVILLE, TENN.

Last spring the jobbing merchants laid in comparatively small stocks, as they did not expect a very active demand on the part of retailers, and were not fully satisfied with the condition of the country. In this they showed considerable foresight, as the spring trade proved to be light and the usual quantities of goods were not disposed of. A strong move was made to sell as nearly as possible on a cash basis, few if any new accounts being opened, and strenuous effort being made to close up and curtail old business. Owing to this action it may safely be stated that the merchants in the district tributary to this city owe less at the present time than at any period during the last four years. Unless some misfortune should occur, or prices rule lower than the cost of production, the fall trade should not only prove large but remunerative, and this without extending more than the usual amount of credit.

NEW ORLEANS, LA.

Country merchants are operating on light stocks, which can be sold on profitable terms and easily renewed. All kinds of goods in the interior in use must soon be replenished, and as soon as the money realized from the growing crops is put into circulation the business of this section of the country must be materially improved.

GALVESTON, TEXAS.

Spring trade fell far below anticipations, which, with the great shrinkage in values destroyed all profit. Notwithstanding all this, collections have been remarkably good. Our merchants are buoyant, and have every encouragement for a fine fall trade. Reports of excellent crops are coming in from every county, especially regarding wheat and cotton (our staple products), and a bountiful yield of other produce is anticipated. Country merchants are nearer out of debt, and on the whole the outlook for fall trade is more promising than for several years past.

MOBILE, ALA.

Business, with few exceptions, has been very much depressed for the past six months, and we note a continued stability among our merchants, owing to the very conservative principles upon which they have operated. The outlook for the fall trade is about as usual, but withal there is a decided tendency to do business on a basis of thrift and economy, with caution on credits.

SAVANNAH, GA.

The volume of trade for the first half of the present year has been unsatisfactory, and for a while the merchants were beginning to get impatient, but at present everything is having a more hopeful look. Merchants are getting to be more economical and prudent, and the indebtedness of the country is thought to be less now than usual. The indications of improvement for the future are very encouraging. The general expression here is one of hope, and, if the crops turn out as well as we expect, we think that the last six months of the present year will be prosperous and satisfactory.

ATLANTA, GA.

The result of an unusual number of failures in this district, it is thought, will be to lessen the number of irresponsible traders, and thus improve the prospects of those that remain, and make general business safer. The extent of business has materially lessened, and profits for the past six months of the year has been slight indeed. S. I. C. elections have not been unsatisfactory, and country dealers have manifested unusual discrimination in purchasing. Stocks are light, and, with an excellent promise of good crops, the prospects for the fall trade are much improved.

BALTIMORE, MD.

Owing to the depression in business in the sections of country that trade in Baltimore, there has not been much over half the usual volume of spring trade done; but, notwithstanding this, our merchants keep up a pretty cheerful spirit, hoping for an improvement in the times. The reports as to the crop prospects in Virginia and Maryland are more than usually favorable, and if a profitable market can be found for the various productions it will enable the country traders of these States to square up back accounts, but our wholesale merchants are not very sanguine as to having a very large increase of business in the near future. They expect and will make preparation for only a moderate trade this fall.

NORFOLK, VA.

The prospects for the fall and winter are encouraging. Increased trade in cotton and corn is expected, and while the amount of traffic in other commodities may not be as great as it has been, the indications are that business will be healthier. Altogether, there is a cheerful tone in business circles.

CHARLESTON, S. C.

The spring business was unsatisfactory, and but few made any money. Collections from the interior have been difficult, and extensions of payments in numerous instances have been a necessity. Our principal reliance is on the cotton crop, which, will, it is thought, equal in amount that of last year. Our merchants are acting very cautiously, and though they may not make much money in the coming season, they will hold their own, and continue to occupy a safe position.

PHILADELPHIA, PA.

The great staple interests of this State continue depressed to an unprecedented extent. The price of iron is far below the cost of production. Furnaces and mills are closed, or, with few exceptions, running at a loss. Coal, through the machinery of a powerful monopoly, is kept up in price; but the sales show a decline of fully two-thirds, as compared with previous years, in consequence of the closing of furnaces and manufactories. The numerous and unexpected financial disasters that have overtaken many old and highly respected firms, have not only impaired the means of solvent houses, but have shaken confidence to such an extent as to paralyze business and smother enterprise. Our business men do not know whom to credit, and the wisest appear utterly unable to forecast the future. In opposition to all this that is gloomy, we get returns indicating good success in agricultural localities, and the crops throughout the State promise favorably. Our city continues to be visited by a large number of strangers, and though expectation as to the extent of trade from the Centennial Exhibition has hardly been fulfilled, there is likely to be a large accession to the regular custom, and the purchases during the autumn, it is expected, will show a considerable enlargement.

PITTSBURGH, PA.

Trade generally in this locality has been much depressed, and the frequent failures in almost every line of business have only increased the feeling of distrust apparent after the panic, and developed a disposition to sell only in a limited way, and credit cautiously. The iron trade has not been lucrative, except in specialties. The dispute as to wages between the manufacturers and their employees is not decided, though a number of the mills are running, the proprietors having acceded to the demands made. The steel manufacturers have been favored, and their trade has kept up quite well. The glass manufacturers have worked up, and have on hand fair stocks, and as a general thing have shut down for the summer months. As a whole, trade has been dull and unsatisfactory, and there is a pretty general complaint of difficulty in making collections. While some few are inclined to take a favorable view of the future, the general idea is not favorable for an early resumption of a healthy paying business.

ERIE, PA.

Business generally in the ten northwestern counties of Pennsylvania is still in a very depressed condition, particularly through the small towns. We had looked for better times this year, but can see little or no improvement. One promising feature of the situation is the prevailing tendency to economize in all private and business expenditures, and to conduct business with more caution than formerly. The three staple products of this region—lumber, iron and oil—are all flat now.

ALBANY, N. Y.

The fact that the manufacturing interest of this section is large and so generally depressed, contributes largely to the feeling of despondency. Were it not for this, we think traders would be more hopeful than for some time past. From every county in our district we have reports of abundant crops of cereals, grass and fruit. The farmers are contending successfully with the potato bugs, and the yield promises well. Trade is generally reported dull, but from a few counties said to be improving, and better than for some time past. The lumber interest is exceedingly depressed, but probably not more so than it was a year ago. The stove business has at least held its own, and some firms have made money. On the whole, while there is yet a large margin before general prosperity, or even ease in business, will be manifest, we feel that we have at least not gone backward during the past twelve months, and that there is with many a hopeful feeling respecting the coming season, which, were it not that a presidential campaign was about opening, would be more pronounced than it now is.

BUFFALO, N. Y.

Trade is chronically dull, and business men generally depressed, although in some departments of manufacture there are symptoms of slight improvement. Our vessel business is especially stagnant, owing in a great measure to low railroad freights, induced by the railroad war, and assisted by the general depression. Sales of merchandise are made very carefully, great discrimination being shown in the selection of customers. Still, collections are slow, and there seems but little encouragement to push business. There is, no doubt, a large falling off in the volume of business, and there is a general feeling that trade and production are overdone; that there are still too many competing for a limited business to make it safe or profitable, and that the return to a healthy condition of things will be necessarily slow, and more the result of the infallible working of natural laws than any artificial or political cause. The crops, both here and elsewhere, so far as heard from, promise to be abundant; money is plenty, and all we need is patience to enable us to wait until we catch up to the business that is in the future.

and which it would be unwise, as well as impossible, to anticipate.

HARTFORD, CONN.

The manufacturers and jobbers of Connecticut have failed to realize any improvement in business during the past year. On the contrary, the depression has increased, and values have become reduced and more uncertain. The volume of business has greatly diminished as compared with the previous year, and the margin of profit has been very close; orders from all parts of the country indicate a general hoarding of resources, and show a very prevalent disposition to buy only from hand to mouth. Comparatively few of our merchants are believed to have more than held their own. Collections show a marked improvement over last year. The banks have more money than they can find use for, and loan on good names at exceedingly low rates—but discriminate very closely.

NEW HAVEN, CONN.

The volume of trade for the first six months of 1876 is about 45 per cent. less than that of the corresponding period last year. The business has been done at very small profit, and in many cases at a loss. Viewed from this vicinity, the outlook is not so favorable as last year, to the extent that many concerns who had, a year ago, abundant cash assets, have seen these considerably reduced by losses in bad debts and shrinkage in values. On the other hand, values of goods manufactured in this section are lower in some cases than ever known before, and producers are reducing the cost of manufacture considerably, and are carrying much smaller stocks of materials, finished and unfinished, and generally holding their assets, though diminished, well in hand. Credits in all lines are being given with increased caution, and the main evidence of a returning prosperity is seen in the fact that business generally is being done on the principles of economy and close attention, prevailing twenty years ago, when the wealth of Connecticut was founded.

PROVIDENCE, R. I.

The local jobbing and retail trades are scarcely so good as they were in the last year, in consequence of the decrease in disbursements of manufacturing establishments. The manufacture of machinery is also less than it was a year ago, with no immediate prospect of improvement. Failures have been quite numerous. There has been a steady shrinkage in value of real estate and of almost every article of production; a gradual liquidation, by failure or want of confidence and restriction of credit, of concerns that have been engaged in operations outside their regular business. No money has been made save in exceptional instances. The indications are that this state of affairs is likely to continue until nearly all who have large debts, as compared with their convertible resources, are forced to a settlement. There is no inducement to capitalists to invest in anything new, even at acknowledged low prices; money is abundant, and every one is waiting, as patiently or impatiently as they may be able, for "bottom" to be reached. The prevailing impression here is that there will be no permanent improvement in the present condition of business until values generally recede so low that capital will be able to see a margin of profit sufficiently large to not only pay a fair return on the investment, but also cover any possible unfavorable change caused by fluctuations in value of the currency of the country.

PORTLAND, ME.

The volume of business has fallen off somewhat as compared with a year ago, but not so much as was anticipated in early spring. Remittances from country merchants are not very satisfactory to our jobbers, money being always noticeably scarce in the country when cash and plenty in the cities. This state is not free from the general lithargy with which all business circles and localities are afflicted at present, but as a whole, can compare favorably with the most prosperous sections. No speculations have tempted any great investments. Economy has been pretty rigidly practiced, hence the shrinkages upon real estate and other investments have not been so marked as in other cities. Shipbuilding is flat, and lumbering interests at a standstill, affecting the eastern section of the State seriously. Manufacturing interests suffer alike with other localities from overproduction. Our agricultural prospects are good, crops of all kinds being well advanced. We can anticipate no very flattering promises for next fall's business, in view of the impending election and uncertainty as to the future.

CANADA.

The condition of trade in the neighboring Dominion possesses more than the ordinary interest for merchants and manufacturers in the United States, because of the notable increase of American goods pressed upon the Canadian market. The pressure to send merchandise to that quarter has resulted from overproduction here, and the tendency has been to slaughter goods in that province rather than to further disturb prices in the markets of the United States. The consequence has been that values have been exceedingly unsettled, and the ordinary channels completely glutted with supplies, at rates so low as to destroy all possibility of profits to traders. A very conservative policy has been inaugurated, especially in relation to purchases abroad, and the figures show that importations from Great Britain are less by one half than they were two years ago. This is the second year of reaction for Canada, and the foreign indebtedness of her merchants must be greatly reduced, while the short credits allowed on American goods have not permitted a large increase in liabilities in this direction. Trade is, however, still largely overdone, an excessive number crowding all avenues and competing without profit for a restricted business. Manufacturers in that plain bitterly of American competition, in that Canada has become the "slaughter house" for the surplus goods of certain lines produced in the United States, against which circumstances it is impossible to compete successfully. In addition to this the vast lumbering and shipping interests of the Dominion continue in a depressed condition, owing to the inanimate demand that exists all over the world for these great staples. In contrast to this gloomy picture, however, the western portion of the Dominion has the promise of a most abundant crop of all descriptions of agricultural produce and the farmers, who form so large an element in the prosperity of the country, are certainly in an exceptionally prosperous condition.

Special Notices.

NOTICE! POND'S TOOLS.

The undersigned has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of MACHINIST'S TOOLS as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, cor. Union and Exchange Sts., Worcester, Mass., under the name of DAVID W. POND, Successor to Lucius W. Pond. CARD.—Having assumed the business mentioned above, I solicit Inquiry and Patronage, with guarantee that present standard of Workmanship and quality of Machinery shall be maintained. A large quantity of New and Second-Hand TOOLS, ALL STYLES and SIZES, For Sale at low Prices. Send for list of second-hand tools. Store at 88 Liberty St., New York, will be discontinued from Feb. 1, 1876, and all sales made from manufactory. Respectfully,
DAVID W. POND,
Successor to Lucius W. Pond.

Special Notices.

SPECIAL NOTICE.

Having established ourselves in business in this city for the sale of
AMERICAN HARDWARE, HOUSE-FURNISHING GOODS, AGRICULTURAL IMPLEMENTS, Etc.,
we beg to solicit correspondence with parties desirous of being represented by us in Germany and surrounding countries.

HAMMACHER & DELIUS.

HAMBURG, Germany, April, 1876.
House in N. Y., A. HAMMACHER & Co., 209 Bowery.

SPECIAL NOTICE

A new style of
MEN'S SINGLE GUNS,
in addition to the former line of A. Simon's, Liege, now offered.

SILESIA SHEET ZINC,

Imported by
LOUIS WINDMULLER & ROELKER,
30 Rode Street, N. Y.

Wanted.—A Partner

In a well established business (8 years) in a Western city. "Jobbing and Retail" in Machinery, Railroad, Mill, Steam and Gas Fitters' Supplies. Steam Heating one of the leading branches, and paying; amount of business annually over \$100,000. Want to extend business and increase the present capital \$30,000. None but first-class business men with experience, energy and capital need apply. Give references. Address **MACHINERY,** Office of *The Iron Age*, 10 Warren St., N. Y.

TO INVENTORS AND MANUFACTURERS

The 4th Exhibition of the American Institute will open September 24th. Machinery will be received after August 15th, other goods after August 24th. Increased awards and a Special Gold Medal for this year. For particulars, blanks, etc., address "General Superintendent, American Institute, New York."

WANTED,

a position as Rolling Mill Superintendent. Experience extending over 20 years in the States and Europe, and embracing all descriptions of rolled iron, including wire rods and wire drawing.

A. E. L.,

Office of *The Iron Age*, 10 Warren St., N. Y.

Specialties of Wrought, Cast, or Sheet Iron or Brass,

Made to order in a SUPERIOR MANNER, AT LOW PRICES, by the

CORRUGATED METAL CO., East Berlin, Conn.

DISCOUNT SCREW LIST.

Revised to date..... 75c
Wrought Hinges and Bolts..... 75c
Cast Hinges and Bolts..... 75c
Bolts..... 75c | Bolts and Files..... 1.00
Dayton & Lamberson, 97 Chambers St., N. Y.

Office of POPE, WILLIAMS & CO., CHATEAUGAY LAKE, May 1st, 1876.

We have placed the exclusive sale of our

CHATEAUGAY STEEL IRON

in the hands of Messrs. Naylor & Co., 99 John St., New York; 208 South 4th St., Philadelphia; 6 Oliver St., Boston, who will hereafter act as our agents, and to whom all orders should be addressed.

Yours truly, POPE, WILLIAMS & CO.

WANTED.—A situation by a practical double entry book-keeper. Would prefer a Rolling Mill, having had several years experience in that business. References satisfactory. Address **J. R., P. O. Box 45, Baltimore, Md.**

CENTENNIAL EXHIBITION.

A young man, a native of this city, with good references, having had large experience in the Hardware Trade, offers his services in receiving, arranging and keeping goods in order during the exhibition. Terms negotiable. Good references. Address, **JOSEPH K. PARKER,** 461 North 2nd Street, Philadelphia.

SITUATION WANTED by an experienced

Hardware man and first-class Salesman, wholesale or retail. Can take charge of business. Salary reasonable. No objection to country. Good references. Address, **HARDWARE, Box 918, Appleton, Wis.**

Notice to Boiler or Machine Shops

in the Neighborhood of New York.

A financially good party wishes to make arrangements toward furnishing good finished work for bridges, roofs, girders at moderate prices.

Apply, LETTER A,

Office of *The Iron Age*, 10 Warren St., N. Y.

WANTED TO PURCHASE,

100 tons good Second-Hand T

Rails, 18 or 20 lbs. per yard.

Address, giving particulars,
PIPER & THOMPSON,
Lapeer, Mich.

A. PURVES & SON,

Corner South & Penn Streets, Phila., Dealers in

Scrap Iron & Metals, Machinery, Tools,

Shafting & Pulleys, Steam Engines,

Pumps & Boilers, Copper, Brass,

Tin, Babbits Metals, Foundry

Facings. Best quality Ingot Brass.

Cash paid for all kinds of Metals and Tools.

HALL & HARBESON,

Manufacturers of

Chemical & Physical Instruments,

191 Greenwich Street, N. Y.

SPECIALTY.—BURNER'S GAS BURNERS, for all heating purposes; BURNER'S IMPROVED GAS CONSTRUCTIVE FURNACES, with 10, 15 and 25 burners. Fine Brass and Metal Work made to order for Metallurgists, Chemists, Experimenters, Colleges, &c.

SITUATION WANTED by a young (married) man.

Has had eight years' experience, five with a city hardware and cutlery house as traveling salesman. A 1 reference. Address **Saleman,** Office of *The Iron Age*, 10 Warren St., N. Y.

VENTILATING & STEAM HEATING.

A thoroughly competent engineer, with extensive experience in the above line, desires employment.

Address, M.,

Office of *The Iron Age*, 10 Warren St., N. Y.

WANTED situation as foreman in a mechanical establishment, by a man 29 years of age.

Is a college graduate, has served a three years' apprenticeship at machinists' trade, and for past two years has been assistant draughtsman in water works construction. References as to ability and character.

Address, **F. M. C., P. O. Box 268, Rochester, N. Y.**

DISSOLUTION OF COPARTNERSHIP

The firm of McClerman & Hynes is this day dissolved by mutual consent. The business of the firm will be liquidated by M. McClerman alone, No. 130 Liberty Street.

New York, Jan. 30, 1876.

M. McCLERMAN,
D. HYNES.

Special Notices.

ROOFS.

Save time and money by sending for estimate for new or old buildings. Send for our 100 page Book (free if you write to-day), and learn how to stop leaks effectually and cheaply, save re-shingling, etc. Correspondence invited. 8 Cedar St., N. Y., or 49 S. Front St., Phila. Mention *The Iron Age*.

JUST ISSUED.

EVERYTHING FOR THE

Seeds, Implements, Machinery, and Fertilizers.

New Catalogue, 200 Illustrations, mailed on receipt 10 cent stamp.

A. B. COHU, 197 WATER ST., N. Y.

Important to Manufacturers.

BISSELL, WELLES & MILLET,

Auctioneers and Commission Merchants, No. 15 Murray St., New York.

Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

Wanted,

A Foreman who has had practical experience in the construction of Architectural Iron Work; must understand draughting and figuring quantities. A permanent situation for a good steady man.

Address **H. W. BELDIN,** 195 Reed St., Milwaukee, Wis., giving terms and references.

Wanted.

A man to keep a set of books and clerk in hardware store, or would sell a half or whole of stock. None but a practical hardware man need apply, and the best of reference must be given.

Address **S. L. McKISSON,** Des Moines, Iowa

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,

IRON AND STEEL,

Care of P. O. Box 813, Bridgeport, Conn.

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

S. B. LOWE,

Chattanooga, Tenn.

Dealer in METALS AND ORES. Special rates of freight to all principal points in the United States and Canada.

TO LET,

A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO., 101 Duane Street, N. Y.

MANUFACTURERS

desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

SCALE: First 3 lines, 3s; every additional line, 10d. Price, 6d. per Copy, or 30s per annum, inclusive of postage to the United States.

Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to

CHESTER STEEL CASTINGS CO., EVELINA ST., Philadelphia, Pa.

ATTENTION is invited to the fact that the Labels used on my Goods, were entered according to Act of Congress in the year 1876, in the U. S. Patent Office.

In addition to a full line of Extension Lip, Car, Machine, Dowel and Hand Rail Bits, also of Boring Machine, Carpenters' and Millwrights' Augers. All my goods are solid CAST STEEL, and perfectly made by means of my Patent Machinery.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866; and July 3, 1866. There is a special claim on each of the Dies. All persons infringing on said patents will be held responsible to the extent of the law.

Russell Jennings, DEER RIVER, CONN., Sept. 7, 1874.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address **CAR WHEEL FOUNDRY,** P. O. Box 134, Selma, Alabama.

Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE.

No. 258 Broadway, New York.

A. V. BRIESEN.

For Sale, &c.

For Sale!

Owing to the death of the senior partner, the surviving partner is desirous of disposing of that part of the business of the firm comprising the Stove and Tin trade. Would dispose of the entire business, including Agricultural Implements, Hardware, Paints, Oils, &c., if desired. Terms easy with good security.

L. PEASE & SON, Hartford, Vermont.

For Sale.

Magnetic Iron Ore For Sale.

1000 tons; contains about 60 per cent. iron; is suitable for making Bessemer steel; makes a fibrous iron; mill cluder may be worked with it to advantage. Delivery at any point on Lakes Ontario or Erie. Apply **J. M. MACHAR,** Kingston, Ontario, Canada. See specimens from Machar Mine at Centennial.

Screw Factory For Sale.

By order of the Bondholders of the International Screw Nail Company, of New York City, there will be sold at Public Auction, Thursday, July 27th, 1876, at 10:30 o'clock, a. m., on the premises recently occupied by the said company, located in the so-called Bay State Village, in the town of Northampton, Mass., the following property to wit: All that tract of land containing about twelve acres, formerly owned and occupied by the said International Screw Nail Company, together with the buildings thereon, consisting of a brick mill 150x40 ft., three stories high and basement, and six dwelling houses; water privilege of about 60 horse-power, steam boiler and piping for heating the mill, and also the full equipment appertaining to said screw factory for the production of 1800 gross of screws per day, viz.: Headers, Shavers and Nickers, Threaders, Patterns, Shafting, Belting, Machine Tools, Office Furniture, Fixtures, Patent Rights, &c., &c.

For catalogues, apply to

W. T. CLEMENT, Esq., Northampton, Mass.

FOR SALE.

An 1/4 inch mill train for making Merchant, Band and Hoop Iron. Will be sold cheap.

Apply to **W. W. JONES,** Near the Lehigh Valley Railroad Depot, Allentown, Pa.

PATENT FOR SALE.

The Swiss Industrial Co., of Neuchâten, Switzerland, have invented an apparatus for heating and ventilating R. R. Passenger Cars, and offer their patent, dated May 26, 1876, For Sale.

Apply to

Mr. A. W. MANNEL, 88 Prince Street, N. Y.

FOR SALE.

TESTING MACHINE, built by the Son-a-Boston Iron Co., arranged for tensile and compressive strains, capacity 150 tons.

MILLING MACHINE, built by Brainerd Milling Machine Co., cutters swing 28 inches diameter, and spindle set at right angles, which insures accurate work.

IRON ROOF, that covers New England Iron Co.'s Mill, 8 arches 80 feet span, posts 18 feet high, building now 80 feet wide by 90 feet long.

ROLLING TABLE, for straightening iron.

PUDDLE TRAIN, for Billets and 8, 4 and 6 inch Bars.

FIVE DRILLS, CORRUATED SHEET IRON and barbed Nails.

shed. He boasts of the Montenegrins as his present allies, and intimates that shortly they will be reinforced by the Herzegovines, the Bosnians, the Bulgarians and the Greeks. He has withdrawn his diplomatic agent from Constantinople, and—in a sentence—bids defiance to the Turk, as stoutly as though all he says were approved by the whole of the great powers. Aye! there's the rub? Is Russia prompting Serbia? Some say so, and even say that a General Somebody-off is in actual command of the Serbian army, which is said to number over 100,000 men. What action do Austria and Germany intend to take? Will Bismarck remain neutral until a critical juncture, and then offer his assistance—at a price? Some people think so; others see no gravity in the situation, and profess that the whole of the great powers—Russia included—are in accord. Diplomatic correspondence disputes this view, and a telegram this morning from Alexandria states that the Khedive has refused to send troops to aid the Turkish government in this contest, on the plea that Egypt is bound to aid Turkey against a "foreign" power only. There is more in this than meets the eye. It simply means that the Khedive is paying the way either to his own absolute independence, or that he is acting under English advice in throwing off "Turkish bonds" prior to becoming a dependent of England. It would, under any circumstances, be advisable that Egypt should fully achieve its autonomy; but I am hardly prepared to say that I think the country would approve of another large State being added to our already too long list of colonies. From a patriotic point of view, the possibilities of what might ensue from our occupation of Northern Africa may afford brilliant speculative dreams, but viewed without the rosewater, I think we had better not assume further responsibilities.

ENGLAND'S POSITION

At this juncture is, there can be little doubt, a most critical one, and we may be at war within the next fortnight. Few people doubt that Russia is playing off the vassal States against Turkey, in order to weaken and distract both, the pretence being almost similar to that under which Moldavia and Wallachia were entered in 1854. This being so, it is obvious that our interests require to be well watched—a vigilance which is being thoroughly exercised. Malta and Gibraltar have been revictualled, overhauled as to stores, &c., and have received powder and ammunition, fitting them for a long siege. All our dockyards are full of men, and, in every respect, the government is getting ready for the worst. It cannot, with truth, be said that the people of this country desire war; yet I am certain they are ready to fight rather than that a single imperial interest should be placed in jeopardy. Russia, as a power, is not liked by the British—an assertion which is pretty well illustrated by the fact that numbers of pensioners, who were in the Crimean campaign, have expressed their willingness to "fight their battles over again"—literally, in case war should eventually arise. Briefly, then, we are at present "trusting in Providence and keeping our powder extremely dry."

THE TRADE OUTLOOK

Is worse and more cheerless than at any previous time. Now no one pretends that any improvement in trade can by any possibility take place, it being palpable that "the thing isn't on the books," and, therefore, cannot "be done." We have given up hoping against hope, and have, at last, made up our several minds that it is altogether a bad business, and can't be helped. We, consequently, give vent to select complaints, and watch for war news, or we settle in our minds that it is practically impossible for a man to exist in town in such broiling weather as this, and that it would be a highly graceful and proper thing to visit our country cousins or recruit our terribly enfeebled frames at the seaside. We smile grimly when we are told, as we are being told just now, that harvest prospects have improved wonderfully of late, and that of both hay and corn we shall reap good average crops, and we grudge incredulous monosyllables when we hear it predicted that this good harvest will do wonders for trade. We know that the present is bad enough for anything, and that the end of the half year and the approach of the quarterly meetings have not made matters any more lively. Everything is down, except prices and wages.

MORE FAILURES.

The number of failures seems to be growing larger week by week. Beside a host of small stoppages for all sorts of amounts under £10,000, several larger failures have been recorded during the week. Among others are the cases of Lumb, Wanklin & Co., London, liabilities £120,000; John Oates, Dewsbury, liabilities £20,000; W. Marshall & Son, Ladyburn, Greenock, liabilities £23,049; Wm. Paterson, Leith, liabilities £15,800, and Knott & Co., Sheffield, liabilities £38,000. In the last instance there are two partners—Joseph and Edmund—and the examination will probably reveal facts of some interest. The firm was usually made to float the concern as a "limited" two days before the bankruptcy petition was filed.

MR. BAIRD'S WILL.

Last week I alluded to the death of this eminent Scottish iron-master, and made mention of his great wealth. It is now stated that he has left £300,000 to the Church of Scotland, and £30,000 each to the Universities of Glasgow and Edinburgh, beside most munificent bequests to pretty nearly every charitable institution in Scotland. The personality of deceased is believed to be nearly three millions.

BRITISH MINING STATISTICS FOR 1875.

At last we have our statistics for one year, before the following one has expired. This is a great step forward, and is, as such, highly commendable. Formerly we were two years behind. The principal figures are those I append:

"The whole produce during the year was 133,306,485 tons, compared with 126,590,108 tons in 1874. The production of fire-clay was 1,932,294 tons, compared with 2,067,791 tons in 1874. The yield of ironstone was 12,018,594 tons, against 11,693,186 tons in 1874, and the produce of shale (almost wholly in Scotland) was 442,940 tons, contrasted with 362,747 tons in 1874. These figures show an increase of 6,716,377 tons of coal, 335,508 tons of ironstone and 80,193 tons of shale, and a decrease of 135,497 tons of fire-clay. This immense production was the work of 535,845 persons, whilst the number so employed in 1874 was 532,829. Of these, 427,017 were employed underground and 108,828 above ground, as compared with 428,611 and 110,218 respectively in 1874. Of these, 11,507 were under 13 years of age, 10 of them being females. In 1874 the number under 13 was 12,816, of whom 22 were females. The total number of females employed was 6564, whilst in 1874 the number was 6892. None of these were employed underground. Durham heads the list for coal with 25,568,349 tons, compared with 24,102,300 tons in 1874. This was the work of 76,774 persons. In 1874 the number employed was 74,553.

Next in yield comes Lancashire, with a total production of 17,930,051 tons, compared with 15,510,699 tons in 1874, and the number of persons employed was 64,544, as against 62,380 in 1874. Yorkshire follows with 15,855,900 tons, whilst the yield in 1874 was 14,827,313 tons. The work was done by 62,190 persons, whilst in 1874 there were 62,499. Next in order in point of productiveness comes Staffordshire and Worcestershire with 14,502,149 tons; East Scotland, with 11,419,619 tons; Glamorganshire, with 9,928,994 tons; Derbyshire, with 7,190,921 tons; West Scotland, with 7,177,888 tons; Northumberland, with 6,755,796 tons; and so on until we find Westmoreland with the modest production of only 2566 tons. With fire clay, Durham is also a long way in advance, the production being 603,236 tons, compared with 733,203 in 1874. West Scotland comes next with 311,200 tons, and South Staffordshire and Worcestershire next with 230,935 tons. Of ironstone, Yorkshire, owing to the yield of the Cleveland district, is far ahead of all competitors with 6,322,333 tons, as compared with 5,641,274 tons in 1874; Scotland is credited with 2,445,697 tons, compared with 2,119,771 tons in 1874; North Staffordshire comes next with 1,700,000 tons, compared with 2,575,844 tons in 1874. Of oil bearing shale almost the whole comes from East Scotland, the production of that district being 377,108 tons, out of the total of 442,940 tons, compared with 277,210 tons, out of a total of 362,747 tons in 1874.

"As respects local yields, copper ores come in the following proportions: Cornwall and Devon, 53,529; Wales, 4239; and Ireland, 5015 tons. Dross spar is only from Shropshire; oolitic freestone is wholly from Somerset and Wilts; gold is reported only from Merioneth and Ireland; gypsum is entirely a Derbyshire and Notts production."

BRITISH SHIPBUILDING THIS YEAR.

A return just made up gives us some interesting comparisons as to the shipbuilding of this and last year. During the first five months of this year we have built 156 steamers, as against 149 in the same period of last year, the gross tonnage of the first four months having this year reached 70,889, as compared with 133,947 in the corresponding part of 1875. We built 280 sailing ships up to May 31st, 1876, of a total tonnage of 92,742 for four months, whereas in the same period of the year before the number was 236, and the four months' tonnage 98,460. We are evidently reverting to sailing again. The Clyde, of course, has turned out the majority of vessels of both classes.

SCOTCH PIG IRON.

There is little news to report "frayoging the Tweed." The shipments do not reach last year's corresponding totals, but they are not to be called very small, although the figures are by no means to be placed in the opposite category. Prices are weak, and freights have come down a little, New York prices being now 2/6, and Montreal 5/1, a drop of 1/6 in the latter case.

Messrs. James Watson & Co., Glasgow, currently report: "There has been a general absence of business in the warrant market during this week, the price having declined from 57/8 to 57/3, cash, closing at the latter figure. Shipments last week were 8071 tons, against 13,101 tons in the corresponding week of 1875." We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow	57/9	55/3
Guthrie, "	58/6	56/6
Coltness, "	59/7	57/6
Summerlee, "	61/6	57/6
Langloan, "	67/6	57/6
Cardross, "	59/6	57/6
Caldar, at Port Dundas	63/4	57/6
Glenargrove, at Ardrossan	63/6	57/6
Eginton, "	57/6	56/6
Dalmellington, "	57/6	55/6
Shotts, at Leith	58/	55/6
Knott, at Boness	59/	55/6

Messrs. Swan Brothers' prices current vary sixpence per ton on either side of the above. There are now 135,100 tons in Connal's stores, and 116 furnaces in blast throughout Scotland.

WORKING HOURS

are again about to become a bone of contention. When the recent wave of prosperity was first perceived the engineers initiated the nine hours' movement, and after a severe fight with the Newcastle employers the men won, and the system at once spread throughout the country. Now the waters are so widely altered, the employers are "having their innings," and have resolved to give notice of the re-adoption of the ten hour's system, or the acceptance of a reduction of ten per cent. in wages. There is certain to be a sharp fight between the two parties on the subject, but under the circumstances the men are bound to submit.

TRADES OF SHEFFIELD.

In one or two departments of the leading iron works establishments of the town and district I am able to state that there has been a somewhat larger amount of business doing during the past week. The increase is not, perhaps, very palpable or very marked, but it is still better than the retrogression which has been characteristic of the past six months, and, as such, is fairly entitled to being recorded in any communication which purports to treat of local trade matters. There is a very steady production of boiler plates at the Atlas Works (John Brown & Co., Limited), that establishment having long had a well maintained reputation for that class of goods, whether of charcoal or blast furnace iron. There is also a fairly good output of ship plates for the Tyne, Clyde, Humber, Mersey, and other yards, together with an increased production of the great armor plates, fort shields and casemates, for which the Atlas and Cyclops works are both world-famous. Some little surprise has been expressed in local circles at the fine armor plates, of American make, described as being on exhibition at the Centennial, these having been an opinion current that no concern other than the two Sheffield ones kept up the requisite machinery for turning out these huge pieces of iron. It is, in fact, nevertheless, that for the present, at any rate we are safe from American competition, although at some future time the makers on the other side of the Atlantic may manage to secure orders from the navies of the South American States, and may possibly enter into competition with us elsewhere.

In the ordinary branches of the iron trade there is no improvement, nor can the most diligent inquiries discover that there is any likelihood of any early alteration for the better. It is becoming more evident every day that there can be no material cheapening of iron until wages are lowered by a further very considerable percentage. An emphatic expression of feeling on the subject has been made by Messrs. John Brown & Co.'s directors in their annual report, and it is certain that something must be done in the matter before long. In the manufactured iron department matters are no better, orders being of a very light description in addition to being few in number. There is, beside, much irritation at the fact that almost all the constructive iron in use in the new buildings in the town is coming from foreign makers. A large erection now being built is being supplied with girders and columns of Belgian manufacture, at a price which is said to be about 12 per cent. lower than the quotations of the local houses. The weight of iron in this case is considerable, and would have been made with not a little pleasure by some of the South Yorkshire or Derbyshire makers. In another case, recently a leading house in Derbyshire was invited to tender,

but its offer was fully 20 per cent. over that of the Belgian house which ultimately secured the order.

Merchant iron is unchanged in price in all respects, common bars being about £7. 10; good medium, £9; sheets, £10. 10 to £11. 10; and hoops, £10 to £12. Boiler plates range from £12 to £15 per ton.

The rail mills are, as a rule, by no means busy, but some of them are executing home orders at about £7. 10 to £7. 15 per ton, at which figure there cannot be much, if any, profit. There is a very light inquiry for tires, axles, buffers, and springs. Wheels in sets are selling in fair quantities, the manufacturers of railway wagons and carriages here and elsewhere being very steadily engaged. At one of the local manufacturers a contract for passenger carriages and brake vans is in course of execution for a leading home line, and the same firm is doing very well indeed in coal and goods trucks and wagons.

The cast steel industry remains in a very quiet condition, no descriptions being in demand except a few best qualities of tool steel, sheets for the use of the Birmingham pen manufacturers in standing contracts, axle steel in small lots for a few of the leading American axle makers, and a few large castings for marine engineering purposes. Prices are, as a natural sequence, cut very fine indeed except in the case of a few leading houses which are resolutely upholding their quotations, even at the loss of orders which must and does almost daily result. This is a fact which is worthy of consideration, as showing the extreme confidence in the future which these makers have and the losses they are prepared to undergo rather than submit to the lowering of their prices and profits.

There is no movement in cutlery or files.

STAFFORDSHIRE AND BIRMINGHAM.

The quarterly meetings are now close at hand, and some of the merchants are doing a little "finessing," in the hope that prices may come down 10 or even £1 per ton. Of this, however, none of the makers would hold out any hope, and they go farther than that and say that the last drop was a complete mistake. There are only 57 blast furnaces going throughout the district, and none of the common iron mills are working above one-third time. The hardware manufacturers are gradually becoming more indifferently employed, many branches which had been fairly steady having now fallen off most materially.

SOUTH WALES AND MONMOUTHSHIRE.

The tin plate manufacturers held a meeting at Swansea last week and decided to continue the reduced output for the next quarter, ending September 30th. The trade is so bad that the step just named will only afford partial relief, and some of the makers contemplate the total closing of their works. The iron works are not doing quite so much business even as before, hardly 1300 tons having been shipped last week. Of this, 900 tons went to Cronstadt. Many of the furnaces still in blast are about being blown out. The Down's establishment is said to be working pretty fairly and on terms which just, and barely, leave a margin of profit.

THE METAL MARKETS

have been quiet during the week. The Birmingham nickel merchants have lowered the price of refined nickel 1/6 per lb.; first and second quality of German silver, 3d. per lb.; and lower qualities, 2d. per pound. At James & Shakespeare's Wallaroo sale, on Tuesday, there were 1555 tons of cakes, and 375 tons of ingots. The average price for cakes was £78. 2/10, and for ingots, £78. 13/7—a general average of £78. 5/10 per ton.

Messrs. Von Dadelzen & North report that "Chilli bars have given way only about 30/- per ton; the latest transactions reported were at £74. 10, cash, and £74 to £74. 10 for forward delivery. English is unsettled, and obtainable on easier terms. Tin is without change in value; a moderate business reported in Straits, from £73. 10 to £74, and Australian at £74, cash; hardly anything done for forward delivery. The Dutch market is quiet, at 45 1/2 fl. for Banca, and 43 1/2 fl. for Billiton. English is tolerably steady at £79 for ingots. Tin plates are without change, and very dull. Lead—Very little doing, and sellers at £20. 15/ of good soft pig lead. Antimony—Rather more doing, and ordinary brands of Silesia cannot be quoted above £23; special brands, in outports, 5/10 extra. Quicksilver has declined to £8 per bottle."

The Mining Journal remarks: "Copper.—This metal has been quiet throughout the week, and Chilli bars are lower now than at the opening. The principal event has been the sale of 1500 tons of Wallaroo cake copper, and 300 tons ingots. The former realized an average price of £78. 2/10, and the latter £78. 13/7 per ton. The average of the previous sale, in March, was for cake £83. 10/1, and for ingots £84. 11/9. The price of English manufactured has been reduced £2 per ton, and the present quotation for strong sheets is £87 to £88. Indian, 4 by 4, £86. Chilli bars, spots, £74. 10/1, and £74 for forward delivery. The result of the Wallaroo sale can scarcely be considered satisfactory to the importers, and the low price realized clearly demonstrates that sellers cannot fix their own time for the disposal of any large quantity to their advantage. It has always been so in copper; sales can only be made when the market is good, otherwise a great sacrifice on the market price must invariably be submitted to. There is no doubt that such sales by public auction are detrimental to the interests of importers, as well as to smelters and holders generally, and the experience of the last two sales may go a very great way to convince sellers that public sale is less profitable than those effected privately. Under these circumstances it could not be surprising that it will be deemed more advisable ere long to resort to the original and decidedly best practice of selling privately through a sworn broker. It has been stated that the fall in the value of Wallaroo is owing to deteriorated quality; but the highest authorities assert that this is not the case, and that it simply arises from excessive quantities now imported of the higher description of copper from Australia, Lake Superior, &c. Wallaroo is now quoted £78. 5/1, and Burra, £78."

Liverpool prices are proportionately easier.

Financial Troubles of English Iron-Masters.

The following comes by cable under date of the 18th instant: The *Financialer* says it has reason to believe that in consequence of the very unsatisfactory tenor of accounts just received in London, and the prospect of some important failure, a large amount of bank notes have been transmitted by some of the banks to the iron districts. The *York Herald* says the great depression in the Cleveland iron trade appears likely to culminate in disastrous financial complications. Rumors have been circulated on 'change that bills of a well known firm have been sent back from the bank. The firm, beside being one of the largest in the iron industry, is also a gigantic financial concern, and on its safety depends the existence of a number of others. A private meeting of the principal iron-masters of the district was held yesterday, but it was rumored afterward that all proceedings were adjourned until Thursday. It is currently believed that it is intended, if

practicable, to convert the firm into a stock company, and by that means meet the exigencies of the case. If that is done the crisis will pass over without a general breakdown.

HARDWARE AT THE CENTENNIAL.

Main Building.

A. FIELD & SONS, Taunton, Mass., and No. 78 Chambers street, New York. It seems difficult to imagine an exhibition of tacks and nails made so attractive as to be a constant source of pleasure to the thousands of visitors to the Centennial, and yet it is a fact that the display of these goods by Messrs. A. Field & Sons is not only wonderful for its variety and the beauty of its mounting, but is so remarkable that it seems impossible to do justice in a paper sketch to the labor, ingenuity and artistic skill combined in this remarkable exhibit. They occupy a space of about 22x6 feet, on which they have erected a handsome structure composed of glass cases resting on nests of drawers, and surrounded by a rosewood railing. In the centre of this structure and resting on the cases is an elaborately carved picture frame about 18 feet long and proportionately high, showing on one side an excellent painting of their works. On the opposite side of this picture is a display that is as beautiful as it is unique. On a large canvass is a picture of the American eagle with flags, shield, &c., surrounded by stars in brass tacks; all the lettering on this card and all the ornamental scrolls, of which there are several, are done with tacks of different kinds and colors. To give some idea of this piece of work, we copy the lettering, which is as follows: "A. Field & Sons, Taunton, Mass., manufacturers of copper and iron tacks, carpet, brush and gimps tacks, tinned tacks; lining and saddle nails, tufting nails and buttons, shoe nails; patent coated tacks in colors, red, green, blue, drab, brown and maroon, glaziers' points;" and in handsome scrolls, "japanned lining nails, common and patent brads, annealed trunk and closet nails, hob and Hungarian nails." The lettering on this card is handsome, and the display type is well balanced. The immense variety of tacks, &c., used is worthy of notice, and the fitness of the tacks to the sense they convey has also been happily carried out. Tastefully arranged in many colored paper boxes in the surrounding glass cases are samples of over 2000 varieties of tacks and nails, japanned, self-color, blue, galvanized, tinned, brass, copper, &c. This house was established in 1827, and the daily capacity of their works is over 50,000,000 pieces.

THE SCOVILL MANUFACTURING CO.,

Waterbury, Conn., and No. 419 Broome street, N. Y., exhibit in a very elegant case, about 30 feet long and 10 feet high, a large assortment of their specialties, among which we notice German silver and gilding metal in ingots, bars and sheets; gold and silver-plated metal for coach lamps, in a variety of sheets of different gauges and widths; embossed and figured brass in sheets; thin German silver, brass, copper, zinc, etc., for stencil work, etc. They also show a complete assortment of fishing rod furniture, including brass and German silver ferrules; trimmings for baby carriages, in German silver and nickel-plated; harness ornaments in a great variety of designs in nickel and silver-plated, oroid and gold finish. In brass butt hinges they show a large assortment, including desk hinges, show case spring hinges, piano hinges, all the patterns and sizes of ordinary brass butt hinges, and the same goods in nickel, silver and gold finish. They further show an excellent line of brass socket and plate furniture casters, in all sizes, from No. 1 to No. 6 of plate casters, and from 3/4 to 1 1/4 inch shallow socket. These goods are a leading specialty with this house, and are the only casters we know of manufactured of wrought metal. An important feature in these casters are the anti-friction rollers, with which they are provided, enabling them to turn readily in any direction, and it is claimed for them that they require a much smaller boring than any other caster on the market, thus leaving wood enough for the screws to hold; they are direct bearing and cannot split the leg of any piece of furniture. These goods are all well finished. They also exhibit metal lamps and lamp trimmings and plated reflectors, both in gold and silver. The lower section of this case is occupied with a beautiful assortment of gilt fancy dress and covered buttons, in almost every conceivable design; plated and German silver thimbles, etc. Underneath the case, in handsomely finished closets, they have, for those who desire to critically examine the goods, duplicates of many of the leading articles on exhibition. Everything shown by this old and well known house is finished in the best possible manner, and we are informed that the goods shown are all taken from their regular stock, a statement fully borne out by an examination of many of the articles, which can be seen in the original packages. The case itself is a handsome piece of furniture, elegantly trimmed with brass furniture of the Eastlake style, the whole guarded with a nickel-plated rail. In the Photographic Hall this company make a large display of photographic goods, such as camera boxes and stands, head rests, frames, picture nails, etc.

THE WHEELING HINGE COMPANY,

Wheeling, W. Va., exhibit their strap and T hinges in a very tasteful and artistic manner. Their structure represents a pair of doors hung on ornamental walnut pillars of massive and elaborate design. On the panels of the doors they show samples of wrought iron back flaps and butt hinges, strap and T hinges, hasps and staples, box hinges, &c.

FRASER & COMPANY,

No. 62 Chatham street, New York, exhibit handsome specimens of taps and dies for watchmakers use up to 230 threads to the inch; a large assortment of engravers' tools, pilers, punches of all kinds, compasses with and with-

out wings, saw sets, pinking irons, brush head wheels for jewelers, rotary pinking machines, burnishing tools, inside and outside chasers, hack saws, curling irons, carpet stretchers, upholsterers' hammers, etc. They also show ingots for casting gold and many other specialties. All of their goods are well and sensibly finished.

GOODSELL COMPANY,

Antrim, N. H., show a case of assorted table and dessert knives, butcher knives, shoe knives, &c.

G. I. MIX & COMPANY,

Yaleville, Conn., exhibit their large assortment of Britannia metal and tinned iron spoons, ladles, forks, dippers, coal shovels, &c. They also show a handsome case of tin and Britannia metal tea and coffee pots, silver-plated water coolers, &c.

KLEIN, LOGAN & COMPANY,

Pittsburgh, Pa., show in one case and upright sample board a good assortment of mining and railroad picks, mattocks and other tools, all in good commercial finish. In their case they display an assortment of the same goods, highly polished.

G. G. HUSSEY & CO.,

Pittsburgh, Pa., show, in addition to sheet brass and copper, and copper bars and ingots, an assortment of stamped and tinned copper bottoms, brass kettles and sheets of O'Neil's planished brass and copper.

MILLER BROTHERS CUTLERY CO.,

West Meriden, Conn., make a very handsome exhibit of pocket knives in every conceivable variety. They show these goods in combination with scissors and other useful articles; also, a handsome line of fine pocket knives in silk lined cases. One of the features of the goods of this company is the manner they have adopted of attaching the scale to the lining of the knife, using neat German silver screws instead of the rivets commonly used. They claim for this method the great advantage of ease in the replacement of broken scales or in taking the knife apart for other repairs. They also show knife blades, scales, linings, springs, &c., in all the different stages of their manufacture.

CARR, CRAWLEY & DEVLIN,

Philadelphia, make a very sensible exhibit of cast and malleable iron hardware. Among the latter they show a good assortment of tinned and japanned harness buckles, harness bits and rings, swivels, shaft tips, stirrups, carriage hinges, &c., clamps, wrenches, carriage steps, etc., etc. In cast iron goods are shown a line of common cast and reversible butt hinges, japanned butts with plated acorn tips, self-locking blind hinges, gate latches and hinges, bat and coat hooks, thumb latches, hasps and staples, blind fixtures, barrel bolts, barn door hangers and rollers, ash or axle pulleys, screw pulleys, &c.; also a good line of wrought iron square bolts, door knockers, brass letter plates, umbrella stands, iron spittoons, foot scrapers, &c., &c.

EASTON LOCK WORKS,

Easton, Pa., exhibit an assortment of rim and mortise locks and night latches. The goods shown are of the medium and common grades.

BEVIN BROS. MANUFACTURING CO.,

East Hampton, Conn., make a large and elegant display of bells. In strapped sleigh bells their assortment is immense; they also show a large variety of gong bells, cow bells, handled dinner bells, both plain and plated, table gongs, brass kettles, &c.

BENJAMIN F. BADGER & SON,

Charlestown, Mass., make a very elegant display of their genuine Emerson and other razor strops. Their case is designed after the Eastlake style of furniture, so popular of late. It is nearly square, and has little ornamentation except on the base, which shows three panels, each of which is inlaid with ornamental tiles. The upper portion is divided into three compartments, the center, a small office with a square glass case lighted on three sides and with mirror in the back on each side. In one of these cases they show genuine Emerson razor straps in a great variety of sizes and patterns; also, the Badger superior strap, after the style of the genuine Emerson, in three sizes; Badger square straps in several qualities and patterns, &c. In the other case are shown some very fine goods in the same line, such as the "Souvenir" strap, in solid leather cases, and with ivory, leather or wood handles; also, small sizes for gentlemen's traveling cases; Badger's extension German belt strap, with steel or wood frames, ivory or enameled handles, and leather cases in eight styles and sizes. They also exhibit a new style of strap, which they call German belt with bone, which is an elegantly finished strap, and can be had in two sizes, with either wood or ivory handles and leather cases.

WOODS, SHERWOOD & CO.,

Lowell, Mass., display, in a very elegant walnut case, a fine assortment of wire goods, such as tea, coffee and milk strainers, wire broilers, sponge racks, gravy strainers, napkin rings, tea-pot stands, casters, fruit baskets, egg boilers, &c.

BLAKE BROTHERS HARDWARE CO.,

New Haven, Conn., exhibit an assortment of common cast butt hinges, reversible butts, japanned butts with and without acorns, both plated and plain; barn door hangers and rollers; axle or frame pulleys, with iron and brass wheel, and both iron and brass face; screw pulleys, iron brackets, crocodile nut crackers, door latches in great variety, brass butts, furniture casters, &c. They also exhibit specimens of handsome real bronze hardware, such as butt hinges, store door latches, &c., and silver-plated butts, axle pulleys, &c.

SANDUSKY TOOL CO.,

Sandusky, Ohio, make a fine exhibit of carpenters' planes and other tools; beside the ordinary jack, smoothing and trying planes, they show some very handsome plow planes, in various woods, elegantly mounted in ivory, &c. They also show samples of matching planes,

plane irons, screw drivers, bench screws, mallets, bung starters, clamps and croquet mallets and balls.

THE D. K. MILLER LOCK CO., Philadelphia, display in a very tasteful manner their large variety of fine padlocks. These goods are self-locking, and are shown in all the grades of finish in which they are supplied to the trade. The manufacturers of these goods guarantee that no two locks are made alike unless specially ordered. Each lock is provided with two keys.

THE STANLEY WORKS, New Britain, Conn., and No. 79 Chambers street, New York, occupy a space in the Main Building about 18x6 feet, on which they have erected a handsome glass case about 14 feet in height, showing goods on all its sides. Among the goods exhibited we notice an assortment of galvanized and tinned strap and T hinges and hasps, wrought iron strap and T hinges and hinge hasps; wrought iron table hinges; plain iron light inside blind butts; light narrow butts, and smooth bright iron butts; wrought iron japanned butts, with japanned, bronzed and silvered acorns; wrought iron butts, polished and silver-plated, and polished, bronzed and nickel-plated; wrought iron flush bolts in great variety, some with sunk thumb piece, others with knobs and slides in real bronze, brass and silver and nickel-plated. They also exhibit Canada bolts with porcelain and mineral knobs; wrought iron flush bolts, polished and bronzed; wrought iron parliament butts with real bronze caps; heavy wrought iron bolts, plain, galvanized, bronzed and nickel-plated; barrel bolts in great variety, both brass and iron; wrought iron butts bronzed with real bronze caps and acorns. The assortment of plain and ornamental butt hinges is large, and the whole exhibit is very complete in the manner of arrangement and classification.

WILSON BOHANNAN, Brooklyn, E. D., N. Y., has on exhibition a case of brass padlocks, which, independent of the fine assortment and good finish of the goods shown, attracts considerable attention from its unique appearance. The case, which rests on a square walnut pedestal, is in the form of the regular pattern of railroad car padlock, and is handsomely gilt. The caps of this lock are of glass, and the inside of the case is partitioned and lined with blue velvet, on which are displayed, on both sides, a large assortment of brass padlocks, from the smallest size made to the heaviest locks for railroad switches and freight cars; these goods are shown with steel and brass keys, and with and without chains. He also exhibits handsome specimens of passenger car locks. All of the goods shown by Mr. Bohannan are well finished, and are fair samples from his regular stock.

Agricultural Hall.

CHAS. G. BLATCHLEY,

Philadelphia, displays ice cream freezers and cucumber wood pumps, making a very interesting exhibit. The pumps have had a large sale, and appear to have proved entirely satisfactory, as the demand is constantly increasing. The following are the latest improvements, viz.: Blatchley's patent handle bracket, arranged with guards on each side, covering the end of the pin, and an annealed metal bushing in the handle, obviating all the difficulties experienced from the wearing of the handle and the loosening of the pin; Blatchley's patent drop check valve, with ring band and ball in one solid piece, which can be withdrawn for repairs without taking up the pump or loosening any of the joints. The pumps are of various sizes and made to suit wells of all depths up to 75 feet. The horizontal ice cream freezer is also a well known article, and commands a large sale, not only in this country but in Europe, South America, and, in fact, a sale of these freezers was made last Saturday for shipment to Asia. The following are the claims put forth on behalf of the horizontal freezer: It makes cream smooth, light and all alike from the top

acids in certain flavors, the cream is always perfectly free of any metallic taste.

CHAS. W. PACKER,

Philadelphia, makes a large display of ice cream freezers, which are specially interesting to the trade, combining as they do all the latest improvements patented in 1876. To describe in detail the various advantages claimed for these freezers would require too much space; the leading features, however, are as follows: The dasher or beater is constructed upon an entirely different plan from that of any other freezer, having, in addition to a pivoted spring scraper (for which letters patent were recently obtained), which is at all times pressed firmly against the inner surface of the can, removing the frozen cream as rapidly as formed. Deflectors attached to, and forming a part of, the beater, which act upon the frozen cream in the same manner as the paddle in freezing by hand, and also direct the unfrozen portions to the sides of the can, by which the whole body of cream is constantly changing position, and is most thoroughly beaten, thus insuring rapid freezing, and also producing the smoothness and richness requisite in good ice cream. The detachable hinged cover may be instantly removed, the hinges allowing it to be thrown over, thus giving free access to the can, and preventing any loss of time if it is desired to examine the state of the freezing; and may also be detached from the top of the tub when its use is not further required. The double gear attachment upon the large sizes particularly adapt them for the use of confectioners, hotels, steamboats, &c. By its use the beater and can revolve at the same time in opposite directions. The cog-wheel freezer is made in sizes suitable for family use, and is well known as a superior ice cream maker. It is easy to operate, and is not liable to get out of order. A new style of confectioners' freezer should be specially mentioned, as it combines several new and important advantages. In place of the pinion cogs, clutches of a peculiar pattern have been substituted, by the use of which it is not required to connect the tub to the platform, as the freezer will remain in place during the operation of freezing without jar or motion; also, by separating the clutches the cover of the tub may be raised without moving the freezer. In examining the freezers it will be observed, that in the construction no part of one size of freezer is made to perform the same work, or answer the same purpose in another size. That is, there is a variation in the sizes of similar parts of the different sizes of freezers, commencing with the smallest in regular gradation—increasing as sizes are enlarged. The reason for this is, that as the quantity of cream to be frozen is increased, greater strength of the working parts is required to overcome the increased labor to be performed. The material used in manufacturing the freezers is the best quality of white cedar wood; the springs are made of the best quality of sheet steel and nickel plated; the tin plate, made and imported expressly for these freezers, is of extra quality and weight, and heavily coated. The sheets are of sizes suitable for each size can, thus avoiding extra seams. As an evidence of the extent to which this business has grown, we may mention that very recently an order was received from Tiflis, in Southeastern Russia, while South America and Mexico are regular buyers of these machines.

American Institute Exhibition.—The American Institute of the city of New York, will hold its 45th exhibition this fall, opening on the 6th day of September next, and continuing until late in November. This exhibition promises to be unusually interesting, inasmuch as special effort is being made this year to have the leading industrial operations carried on upon the premises. A special award of a gold medal is offered for this year, to be known as the "Centennial Medal."

Maguire's Patent Shoe Brush.

We illustrate herewith a shoe brush and a dauber with scraper attachment, recently



to the bottom of the can. The tub being closed at the end, and perfectly air-tight, prevents the waste of ice by the action of the atmosphere, and secures a uniformity and intensity of cold within the freezer unexcelled by any other machine. The saving of ice alone will pay the whole cost of a freezer in a single season. The tub never needs refilling with ice during freezing, even with the largest sizes. The lid of the can is looped down, the bevel fitting tightly upon an elastic gum gasket running around the outside of the can. The wedge shaped joint with rubber bearing secures against all danger of the salt water leaking into the cream. The horizontal position of the machine, the air-tight tub, the uniform distribution of the salt water over all parts of the can, and the direct application of the power to the tub or beater, effect an important saving in both time and labor. Nothing but the best and most durable material is used in their manufacture. The tubs are made of the best timber, with galvanized hoops. The beater and the more important castings are made of malleable iron, obviating almost entirely the danger of breakage. The iron work is carefully tinned or galvanized, and practically rust proof. The beater revolves independent of the can, so that the cream may be beaten as much or as little as may be desired. The beaters are tinned instead of galvanized. The tinning being entirely unaffected by the action of the

mud. With a brush provided as this novelty is a good deal of time, labor and annoyance is saved, while the scraper, from its peculiar formation, does its work more effectively than any of the improvised contrivances referred to. Graham & Haines, No. 113 Chambers street, are sole agents for the manufacturers. They inform us that the additional cost for shoe brushes, with this improvement, is trifling.

The Bridgeport Daily Standard, of 17th instant, has the following: "We understand Messrs. Hotchkiss' Sons have lately commenced a suit against the Lawrence Curry Comb Co., of New York city, who, they claim, are infringing upon their patents by the manufacture of the so-called 'perfect comb.'"

An order for arms for a militia company in South Carolina was sent to one of the principal fire arms manufacturers of the North to be filled. It was returned with the statement that it would be twelve months before the order, which was for a few stand only, could be filled, the explanation being given that the manufactory was worked to its utmost capacity to fill Western orders for arms. The presumption is that these orders come from post traders, who are selling them to the Indians. This traffic should be unconditionally prohibited, and if supplying arms to the Indians could be made a capital offense, and the punishment of traders in this nefarious traffic left with the military commanders, we should have a better condition of affairs on our frontiers.

RIEHL BROTHERS,
Office and Works, N. 9th St., above Market, Phila.
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New York Store, 33 Liberty Street,
Pittsburgh Store, 43 Smithfield Street.

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"Patented" Furnace Charging Scale.
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JOHNSON'S PATENT UNIVERSAL LATHE CHUCK.

We invite attention to the superior construction of this chuck. Its working parts are absolutely protected from dirt and chips. It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List address: Lambertville Iron Works, Lambertville, N. J.

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Manufacturers of
WHIPS & LASHES
OF EVERY DESCRIPTION.
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CHILLED DIES for Drawing Wire.

Manufacturers of **STEEL WIRE** for all purposes, **STEEL SPRINGS** of every description. Market Steel Wire, Crinoline Wire, tempered and covered, also Patent Tempered Steel Furniture Springs, constantly on hand. 234, 236 and 238 West 29th Street, NEW YORK.

C. SCOFIELD'S STRAIGHTENER OR BENDER,
For Shafting, Axles, Tubes, Rails, &c.

There has long been a want of some device by which the straightening of shafting could be done without removing the work from the centers, and at the same time do it quickly and accurately. The SCOFIELD PATENT SHAFT STRAIGHTENER meets just such a want; the apparatus is light and can be easily handled, yet it is of sufficient strength for the purpose required. It can be placed upon the shears of the lathe, and moved along the entire length of the work. It is especially adapted to removing short bends, which frequently occur in long lengths of shafting. The lightness of the Straightener renders it eminently adapted for line and counter-shafting, without necessitating the time and trouble of removing hangers and detaching couplings, but can be easily applied to the shaft while in position. It can also be used on the bench for short lengths.

For Circulars, Price List, &c., Address,
C. SCOFIELD & CO.,
Vineland, N. J.

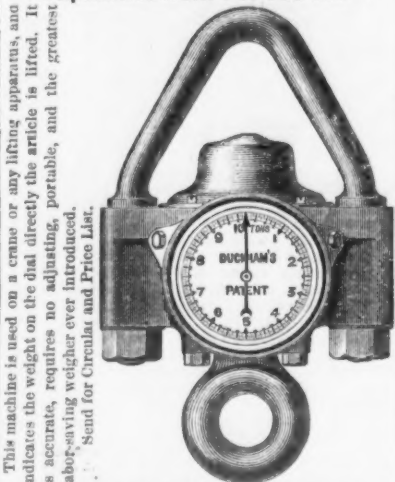
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Suspended Self-Indicating
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Capacities from 1 to 100 tons.



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Hydraulic Presses, Accumulators, &c.
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Tackle Blocks
Of all Description.

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Well and Ships Pumps.
Patent Pressed PUMP LEATHERS.
Dealer in **LIGNUMVITÆ WOOD.**
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THE HARTFORD CURVE SCRIBE CO.
24 Broadway, N. Y.
Sent by mail in any order for \$1.00 with Coupon \$2.00.



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Standard Bellows.
GEO. M. SCOTT
MANUFACTURER
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JOHNSON ST.
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PYROMETERS
for BLAST FURNACES.
E. BROWN'S STANDARD PORTABLE,
E. Brown's Improved Gauntlet

Edw. BROWN,
311 Walnut St., Philadelphia.

ALSO FOR SALE
PYROMETERS
For Baker's Ovens, Boiler Flues, Galvanizing Baths, Oil Stills, Vulcanizers, Superheated Steam.

Over 300 "Gauntlet" and 100 Portable Pyrometers are now in use at Blast Furnaces.

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ALSO
REVOLUTION INDICATORS.

The Revolution Indicator is driven like a governor, either from a horizontal or vertical shaft; it constantly indicates, without the use of a watch, the number of turns per minute made by a Steam Engine.

There are many engines which have to run at varying speeds for different operations, also engines controlled entirely by hand. For such, the Revolution Indicator will be found particularly useful.

Circulars on application.

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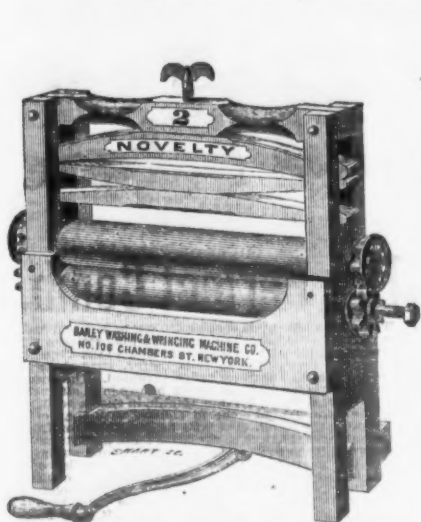
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REVOLUTION INDICATORS.

NOVELTY, EXCELSIOR, RELIANCE, AND SHERMAN CLOTHES WRINGERS.



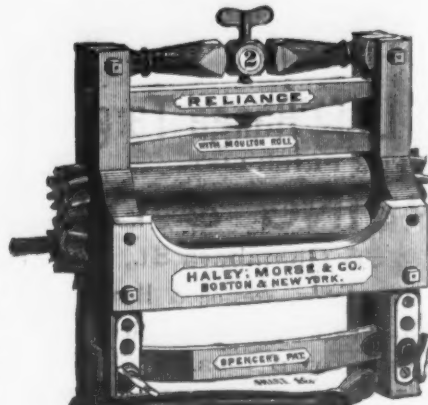
Has the PATENT CURVED CLAMP, an IMPROVED WATER BOARD, & NEW CRANK FASTENING, and all the iron parts are Malleable.



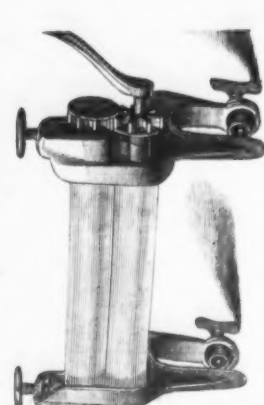
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In wringing with this machine, all the strain comes on the Bench, while the labor of using it is not half that required by the ordinary Tub Wringers.



RELIANCE WRINGER, with DOUBLE SPIRAL GEARS and PATENT MOULTON ROLLS.



SHERMAN WRINGER with GALVANIZED IRON FRAME, which will not rust.

Twenty-four Different Styles and Sizes.

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Manufactured by

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We invite the particular attention of the trade to our New Straight Bar Wrench, widened, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the Genuine Wrench by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.



GOLD MEDAL Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

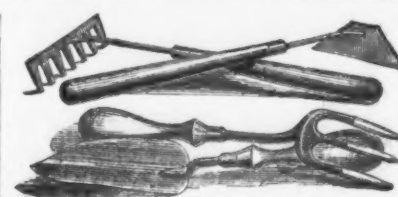
In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the adjuster and secures

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We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

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This set of GARDEN TOOLS, is put up in a nice paper box, and is superior to any other in the market. The tools are made of the best quality of Steel, highly polished, and of malleable iron polished or painted, with birch handles. We will make it an object for every dealer to handle them.

PRICE \$15, PER DOZEN SETS.

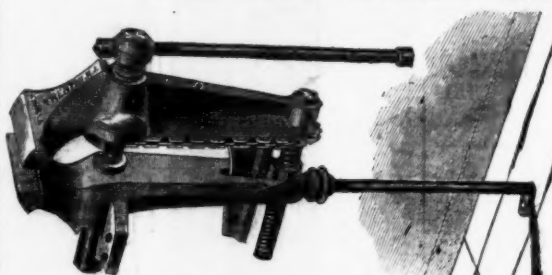
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This Chair is made of the best second growth White Ash, finished on the wood, with Brussels Carpet Seat. It shuts up to the size of a single chair post, and weighs only one pound. Every person who forgets to take one with him when he goes to the Centennial, will be sorry when he gets there, as no chairs are provided for visitors, and they get very tired. Every store in the land can sell a few of them at a profit. They are a very popular article here.

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The New Double Screw Parallel "Leg" Vise.



We are now ready to furnish, as the result of more than thirty years' experience, our latest style of Vise—the best yet made. It is stronger than any other, whether of Foreign or of American make; always parallel and holding with a tighter "grip." The jaws are of convenient shape for the workman to get near his work equally well for filing or chipping. Instead of the heavy, clumsily formed jaws of the cast iron Single Screw Vises of the common "parallel" type, and which, depending upon slide alone for preserving parallelism, can never be screwed up very hard without "jamming" on the slides or breaking.

Our New Vise combines all the advantages of the "Peter Wright" Leg Vise, of strength and lightness, fastening to the floor and bench, and at the same time greatly superior to it; is always perfectly parallel at all points of opening, and never gets out of line. Embodying the same general principle as the well known Chain Vise, so long made by us, we have by new, scientific proportioning of all the parts, and with our recently improved metals for their manufacture, obtained so perfect a tool, that we now warrant these Vises for three years from date of manufacture stamped upon each.

The jaws are of best Tool Cast Steel, welded on, file cut and properly hardened. The screws are forged of the best refined iron, and work in solid cut thread boxes. The lower screw maintains the parallel position of the two jaws, by having exact motion with the upper working screw through the connecting chain which regulates it. The chain is very accurately made of steels links and rivets, and having no strain of the work upon it, is therefore as durable as all the other parts.

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No. 1. Jaws 8 1/4 in. x 1 1/2 in. Screws 1/2 in. diameter. Lever 3 in. long. Opens 4 1/2 in.	\$5.00
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" 3. " 5 1/4 in. x 1 1/2 in. " 1/2 in. " " 16 in. " " 6 in. " " 5 1/2 in.	\$3.50
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" 5. " 4 1/2 in. x 1 1/2 in. " 1/2 in. " " 14 in. " " 9 in. " " 5 1/2 in.	\$2.50
" 6. " 4 in. x 1 1/2 in. " 1/2 in. " " 13 in. " " 10 in. " " 5 1/2 in.	\$2.00

All sizes of these Vises furnished with Swivel Attachment, at an additional cost of \$1 to \$5. Sold at the General Agencies.

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MANUFACTURED BY
Howard Iron Works,
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RUSSELL & ERWIN MFG. CO. NEW YORK & PHILADELPHIA AGENTS.

SOMETHING NEW! SAMSON WRENCH.



It is the only Wrench that will hold Gas or Steam Pipe, Gas Burners, Round Iron or Steel without slipping. Samples sent to the trade only, on receipt of fifty cents and business card.

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The New Ballard Rifle.



Hunting, Short and Long Range Target Rifles.

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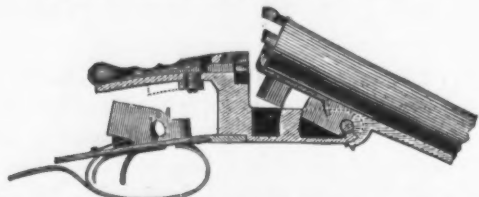
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Standard O. K., F. & W. Double Action, Wesson & Harrington new line Revolvers. Send for Reduced Price List.

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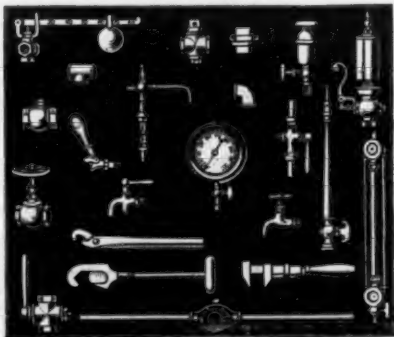
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We caution
purchasers to
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above trade
mark, and to
insist on the
highest quality
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product.

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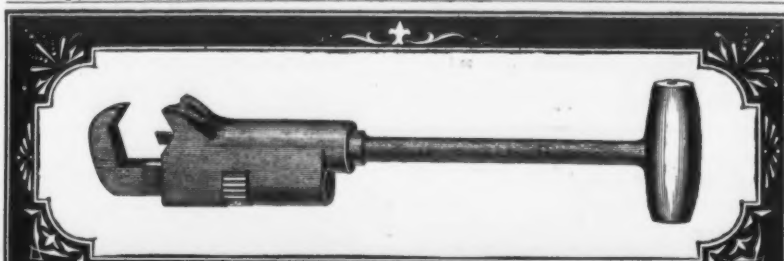
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Cuts Wrought Iron, Brass and Copper Pipes, Round Iron &c perfectly true without leaving burr on pipe, contracting or splitting it. Cuts out a chip similar to a lathe tool. The knife may be removed and ground. Send for descriptive circular to manufacturers.

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COMBINING SIMPLICITY AND DURABILITY TO A
REMARKABLE DEGREE, ITS PARTS ARE EASY OF ACCESS
AND IT IS ADAPTED TO ALL PURPOSES FOR WHICH
STEAM PUMPS ARE USED.

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THE SELDEN DIRECT-ACTING
STEAM PUMP
PAT. AUG. 2, 1870. DECEMBER 20, 1870
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William Law,
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No.	each, \$	Upright.
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Twenty-five per cent. discount to the trade.
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and all kinds of Railway Supplies. Iron and Wood Work
for Cars, Bridges and Buildings.
Agent for W. C. ALLISON & SONS.



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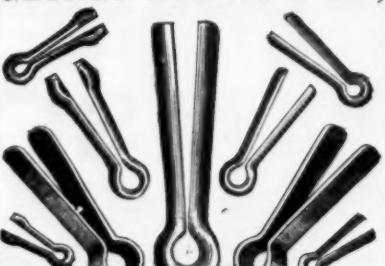
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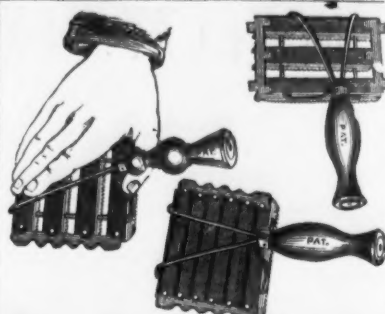
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Manufacturers, Syracuse, N. Y.

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ORNAMENTS**

For Tin, Japan Ware, Safe and Canning Manu-
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JULIUS FECHTELER, 104 John St., N. Y.
I sell my Carriage Ornaments to dealers only.



The Perfect Comb.

We call your attention specially to our new patent end-
less wire comb. The result of a long series of ex-
periments, made with a view to meeting all the re-
quirements of a Perfect Comb. It is better, stronger, and
more durable than any ever before invented. The raised
wire shank gives what has never before been attained,
viz: a rest and brace for the thumb, in such a position
that the hand cannot come in contact with the horse
while using the comb. The wire braces which run from
the shank over the back to the front teeth give strength
and durability in a direction never heretofore attained,
and at the same time serve as an extra handle; and
when clasped by the fingers in connection with the raised
shank the comb is more firmly held, and completely
held, and with much less fatigue to the hand than is
possible in any other formation—in short, it needs but a
trial to vindicate its name: The Perfect Comb.

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WM. S. CARR & CO.

Sole Manufac-
turers of



CARR'S

PATENT

Water

Closets,

PUMPS, CABINET WOOD WORK, &c.

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J. AUSTIN & CO.,

168 Fulton Street, N. Y.,

Proprietors and Manufacturers of

WHEATCROFT'S SELF-ADJUSTING

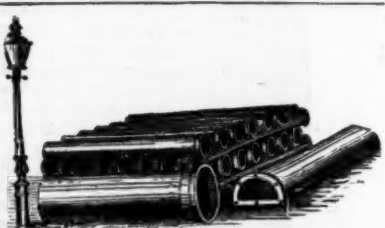


Pipe Wrench,

Scripture's Funnel Top
MACHINE OILERS.

Dealers in

STEAM AND GAS FITTERS TOOLS.



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Manufacturers of

Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,
Mathew's Pat. Anti-Freezing Hydrants.
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Lehigh, Wyoming White & Red Ash,

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GEORGE S. NEWTON, Agent, Shipments by Rail-
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The Iron Age Directory

and Index to Advertisements.

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Ostrander W. H. 19 Ann, N. Y.	1
Alum.	
Tucker & Dorey, Indianapolis, Ind.	30
Animal Poles.	
Bishop & Benedict, Beres, O.	12
Apples, Manufacturers of.	
Flint & Norton, Trenton, N. J.	21
Augers, Bits, etc., Manufacturers of.	
Clark Wm. A. Westville, Conn.	13
The Conn. Valley Mfg. Co., Centerbrook, Conn.	8
The Douglass Mfg. Co., 69 Reade, N. Y.	2
Axes, Edge Tools, etc., Manufacturers of.	
James H. & Co., Cohoes, N. Y.	21
Axles, Springs, etc., Manufacturers of.	
Brook & Arthur & Co., Plainville, Conn.	12
Cook R. & Son, Weymouth, Mass.	12
Spring Perch Co., Bridgeport, Conn.	12
Tomlinson Spring & Axle Co., Bridgeport, Conn.	12
Richards W. G. & Co., Brooklyn, E. D.	21
Azle Grease, Makers of.	
Frazer Lubricator Co., 104 Maiden Lane, N. Y.	34
Band Saws and Tools for Brazing &c., Im-	
porters of.	
General George & Son, 39 W. 4th, N. Y.	12
Barn Door Hangers.	
Moore S. H. & E. 66 Lake, Chicago.	9
Bed Screws, Makers of.	
Sheldon Co., Birmingham, Conn.	30
Belted, Manufacturers of.	
Churchyard, Joseph, Buffalo, N. Y.	20
Newcomb Bro's., 586 Water, N. Y.	20
Ball & Geo. M., Chicago, Ill.	20
Bells.	
Baltimore Bell and Brass Works, 53 and 55 Hol-	
iday, Baltimore, Md.	12
Williams E. A. & Son, Plymouth, Jersey City,	
N. J.	2
Blind Hinges.	
The Holbrook Patent Blind Hinge Mfg. Co., Water-	
town, N. Y.	6
Belting, Leather, Makers of.	
Alexander Bros., 412 N. 3d, Phila.	31
Amey Charles W., 149 N. 3d, Phila.	31
Foranough Wm. F. & Bro., Phila.	31
Bird Lanes, Makers of.	
Lindeman O. & Co., 241 Pearl, N. Y.	10
Maximether John, 249 Pearl, N. Y.	10
Osborn Mfg. Co., 79 Blocker, N. Y.	10
Bit Brasses, Manufacturers of.	
Milner's Falls Mfg. Co., 74 Chambers, N. Y.	21
Blowers, Makers of.	
Keystone Portable Forge Co., Philadelphia.	29
Bolt Machines, Makers of.	
Kosuth S. C. & Co., N. Y.	29
Bolts (Screws).	
Samuel Hall's Son & Co., 239 W. 10th, N. Y.	11
Borax.	
Pfizer Chas. & Co., New York.	6
Brass Huts, Makers of.	
Wm. Wm. F. 240 Pearl, N. Y.	11
Brass, Manufacturers of.	
Anso's Brass and Copper Co., 19 Cliff, N. Y.	2
Baltimore Bell and Brass Works, 53 and 55 Hol-	
iday, Baltimore, Md.	12
Benedict & Vose 99 Chambers, N. Y.	2
Davol John & Son, 109 John, N. Y.	2
Holmes, South 10th & Chambers, N. Y.	2
Rickover Mfg. Co., 280 Pearl, N. Y.	2
Manhattan Brass Co., 23 Reade, N. Y.	2
Miller Edw. & Co., 23 Reade, N. Y.	2
Plum & Atwood Mfg. Co., 80 Chambers, N. Y.	2
Sevill Mfg. Co., 41 Broome, N. Y.	2
The Wilmet Mfg. Co., 23 Reade, N. Y.	2
Bridgeport, Conn.	2
Waterbury Brass Co., 43 Reade, N. Y.	2
Brick Presses, Makers of.	
Chapman F. L. & Co., 62 Remondant Ave., Phila.	24
Schantz Marcus Perth Amboy, N. J.	24
Bridge Builders.	
Mosley Iron Bridge and Roof Co., 5 Day, N. Y.	5
Leitchon Bridge and Iron Works Rochester, N. Y.	10
Brushes (Wheel).	
Prester P. M., 117 John, N. Y.	11
Butcher and Shoe Knives, Manufacturers of.	
Wilson John, Sheffield, England.	29
Baths and Sinks.	
American Spring Bath Co., 82 Beekman, N. Y.	20
Sample, Birge & Co., St. Louis, Mo.	31
Union Mfg. Co., 38 Chambers, N. Y.	21
Carriage Bolts, Makers of.	
Carriage Hardware, Makers of.	
Smith H. D. & Co., Plantville, Ct.	18
Carriage Hardware, Makers of.	
Taylor Iron Works, High Bridge, N. J.	6
Casters (Furniture).	
Taylor John, Sons & Co., Newark, N. J.	36
Chemical and Physical Instruments.	
Hall & Harbison, 108 Greenwich, N. Y.	16
Chisels, Manufacturers of.	
Buck Bros., Millbury, Mass.	3
Coal, Miners of.	
Lehigh Valley Coal Co., 67 Courtlandt and Church,	
N. Y.	22
Pardee A. & Co., 111 Broadway, N. Y.	22
Coal Vases.	
Sidney Shepard & Co., Buffalo, N. Y.	27
Cold Heds, Manufacturers of.	
Eastbrook Wm. H. & Son, Phila.	22
Coffee and Spice Mills.	
Lane Brothers, Millbrook, N. Y.	6
Enterprise Mfg. Co., Philadelphia, Pa.	3
Compasses and Dividers, Manufacturers of.	
Smith & Call Hard & Co., Springfield, Mass.	12
Compound.	
Nichols G. H. & Co., 104 Maiden Lane, N. Y.	12
Copper's Tools, etc., Dealers in.	
Little Chas. E., 59 Fulton, N. Y.	24
Corrugated Iron.	
Mosley Iron Bridge and Roof Co., 5 Day, N. Y.	5
Cotton Gin Feeders, Manufacturers of.	
The Brown Cotton Gin Co., New London, Conn.	34
Crushers and Pulverizers.	
Greene Lett & Co., 108 Chambers, N. Y.	10
Cutlery, Manufacturers of.	
Cutlery, Importers of.	
Baker Herman & Co., 101 Duane, N. Y.	23
Blakeworth F. W. 59 Chambers, N. Y.	23
Fisher Jos. S., 41 Commerce, Phila.	11
Friedman & Lastering, 14 Warren, N. Y.	11
Kline, Briggs & Co., 108 Chambers, N. Y.	11
Maximether John, 249 Pearl, N. Y.	11
Rogers & Bro., 208 Broadway, N. Y.	11
Ford Aseline, 107 Pearl, N. Y.	11
Wilson Hawksworth & Co., 72 John, N. Y.	11
Cutlery, Manufacturers of.	
Burgess & Son, 108 Chambers, N. Y.	11
Lambson & Goodnow Mfg. Co., 85 Chambers, N. Y.	11
Menden Cutlery Co., 69 Chambers, N. Y.	11
Miller Bros. Cutlery, 108 Chambers, N. Y.	11
Naughton Cutlery Co., 89 Chambers, N. Y.	11
New York Knife Co., Walden, N. Y.	11
Do Nuzzles.	
Williamson James & W. T., 69 Duane, N. Y.	12
Door Alarm, Makers of.	
B. Blackmore, 432 Madison, N. Y.	10
Door and Gate Springs.	
Quackenbush, Townsend & Co., 99 Reade, N. Y.	30
Van Wagner & Williams, 82 Beekman, N. Y.	31
Door Knobs, Makers of.	
The Parker & Whipple Co., 97 Chambers, N. Y.	30
Dredging Instruments.	
The Hartford Dredge Co., 294 Broadway, N. Y.	20
Dredging, and Makers of Dredging Machines.	
Am. Dredging Co., 10 S. Delaware Ave., Phila.	35
Drill Chucks, Manufacturers of.	
Fraze & Co., 62 Chatham, N. Y.	34
Lamberville Iron Works, Lamberville, N. J.	34
Drilling Machines, Makers of.	
Thorne, DeHaven & Co., Philadelphia.	34
Drop Forgings.	
Billing & Spencer Co., Hartford, Conn.	16
Baker Hermann & Co., 101 and 108 Duane, N. Y.	16
Hammond H. & Co., Hartford, Conn.	16
The Hall & Helden Co., Danbury, Conn.	16
Edge Tools, Makers of.	
The D. B. Barton Tool Co., Rochester, N. Y.	20
Wiles N. & Co., 4 and 6 John, N. Y.	20
Elevators, Makers of.	
Crane Bros. Mfg. Co., Chicago, Ill.	9
Knake Machine Co., 1176 Tremont, Boston, Mass.	34
Emery.	
Geo. H. Gray & Son, 108 Chambers, N. Y.	30
The Union Stone Co., 6 Exchange, Boston.	30
Emery Cloth.	
The Union Stone Co., 6 Exchange, Boston.	30
Emery Wheels, Makers of.	
Brady Mfg. Co., 240 Plymouth, Brooklyn, N. Y.	30
The Union Stone Co., 6 Exchange, Boston.	30
Enamelled Plates.	
Lefferts Enamel Works, 417 W. 24, N. Y.	4
Engineers, Manufacturers of.	
Benjamin James, 108 Chambers, N. Y.	34
Moore James, 97 and 108 Broadway, Phila.	30
Obl & Henschel, 97 and 108 Broadway, Phila.	30
Engines, Steam, Makers of.	
Ervin Chas. W. & Bro., Kensington, Phila.	35
Hartford Foundry and Machine Co., Hartford, Ct.	35
Lovely & Co., 121 South 4th, Phila.	35
Fayre B. W. & Sons, Corning, N. Y.	35
Shapley & Wells, Blauvelt, N. Y.	35
Engravers.	
Collins Geo. H. 10 Warren, N. Y.	4
Swinton A. 72 Chester, Phila.	24
Faucett, Makers of.	
McNab & Harlin Mfg. Co., 36 John, N. Y.	24
Faucets, Self-Measuring, Makers of.	
Faucet Mfg. Co., 97 F. John, N. Y.	24

Larr J. & Riley 82 John, N. Y.	24
Flaser Joseph S., 41 Commerce, Phila.	11
Flaser Peter A. & Co., 28 Fulton, N. Y.	24
Moss F. W. 99 John, N. Y.	24
Sanderson Bros. & Co., 16 Cliff, N. Y.	24
Speck & Jackson, 89 Chambers, N. Y.	24
Files, Manufacturers of.	
Adamantine File Works, Providence, R. I.	18
American File Co., Pawtucket, R. I.	18
Ansonia File Works, 89 Chambers, N. Y.	18
Barrett G. & H. A. and Richmond, Phila.	18
Diston Henry & Sons, Phila.	20
Praper C. I. & Co., Sing Sing, N. Y.	18
Heller & Bros., Newark, N. J.	18
Hiscox File Mfg. Co., West Chelmsford, Mass.	18
Johnson & Bro., 1 Commercial, Newark, N. J.	18
McCaffrey & Bro., 122 and 124 N. 4th, Phila.	18
Nicholson File Co., Providence, R. I.	18
Paul Chas. P., Williamsburgh, N. Y.	18
Wood A. & Co., 385 Atlantic Ave., Boston.	18
Fire Brick, Makers of.	
Ames Chas. & Sons, Woodbridge, N. J.	24
Berry Wm. H. & Co., Woodbridge, N. J.	24
Brooklyn Clay Refractory and Fire Brick Works, Van	
Drake St., Brooklyn, N. Y.	24
Bell & Bacon, Troy, N. Y.	24
Hall A. & Sons, Pottsville, Pa.	24
Hall A. & Sons, Buffalo, N. Y.	24
Maurer Henry, 418 East 23d, N. Y.	24
Neale & Co., 108 Chambers, N. Y.	24
Newkumet Philip, 2nd and Vine, Phila.	24
Newton & Co., Albany, N. Y.	24
Valentine M. D. & Bro., Woodbridge, N. J.	24
Watson John R. Perth Amboy, N. J.	24
Weber Adam, 1838 E. 14th, N. Y.	24
Wood A. & Co., 385 Atlantic Ave., Boston.	24
Flint and Emery Paper and Cloth.	
Baecker, Adamson & Co., 730 Market, Phila.	4
Fishing Tackle.	
Bradford & Anthony, 374 Washington, Boston.	3
Shilley A. B. & Son, 28 Commerce, Phila.	3
Flue Cleaners, Makers of.	
The Chambers Spence Co., foot of E. 9th, N. Y.	32
Fluting Machines.	
The American Machine Co., 430 Walnut, Phila.	32
Forges, Portable, etc.	
Keystone Portable Forge Co., Philadelphia.	29
Place George, (Hurricane) 121 Chambers, N. Y.	29
Founders and Machinists.	
Sam J. Creswell Jr., 812 Race, Phila., Pa.	6
Foundry Furnaces.	
Cutter & Brown, 288 Cherry, N. Y.	4
Paxson J. W. & Co., 514 Beach, Phila.	4
Whitehead Bros., 517 W. 13th, N. Y.	4
Fracture Traps.	
Patterson J. M., Woodbury, N. J.	31
Galvanized Iron.	
Richmond & Co., 119 S. Fourth, Phila., Pa.	31
Gauges, Makers of.	
Lefferts Marshall Jr., 90 Beekman, N. Y.	4
Gong Bells, Makers of.	
Edw. Sweeney, 4 Duane, N. Y.	3
Governors.	
Huntton Governor Co., Lawrence, Mass.	36
Julius Judson & Son, Rochester, N. Y.	36
Shive Governor Co., Bethlehem, Pa.	36
Grain Bars.	
Vanderbilt Geo., foot W. 19, N. Y.	4
Grain Cradles and Sifts.	
Sample, Birge & Co., St. Louis, Mo.	31
Grainstones.	
Parker Gilbert, 225 Market, N. Y.	16
Wood Walter R., 235 and 237 Front, N. Y.	16
Worthington & Sons, North Amherst, O.	16
Guns, etc.	
Moore's John P. Sons, 300 Broadway, N. Y.	22
Schovelling & Daily, 84 Chambers, N. Y.	22
Windmiller Louis & Roelker, 30 Reade, N. Y.	22
Hardware, Makers of.	
Kiehlend F. L. Dupont 70 Wall, N. Y.	28
Lamson & Goodnow Mfg. Co., 85 Chambers, N. Y.	28
Hammers, etc., Manufacturers of.	
Emmet Hammer Co., Brooklyn, E. D. N. Y.	13
Hammond H., Hartford, Ct.	13
Hand Tools, Makers of.	
Carroll Handle Co., 79 Reade, N. Y.	5
Greenboro' Hardware Co., 108 Chambers, N. Y.	5
Sample, Birge & Co., St. Louis, Mo.	31
Hardware Commission Merchants.	
Grass & Haines, 118 Chambers, N. Y.	20
Peck G. Webster, 110 Chambers, N. Y.	20
Watkinson G. B. & Co., 83 Reade, N. Y.	20
Field John, 108 Chambers, N. Y.	20
Wilson J. Clark & Co., 81 Beekman, N. Y.	20
Hardware Dealers.	
Betts & Burger, 38 Chambers, N. Y.	24
Lloyd, Supple & Walton, 625 Market, Phila.	24
Quackenbush, Townsend & Co., 99 Reade, N. Y.	31
Quackenbush, Townsend & Co., 99 Reade, N. Y.	31
Wilson J. Clark & Co., 81 Beekman, N. Y.	20
Hardware Importers.	
Baker Hermann & Co., 101 Duane, N. Y.	23
Field Alfred & Co., 85 Chambers, N. Y.	23
King, Briggs & Co., 80 Chambers, N. Y.	11
Van Wagner & Williams, 82 Beekman, N. Y.	31
Harold E. W., 72 Chambers, N. Y.	11
Windmiller Louis & Roelker, 30 Reade, N. Y.	22
Hardware Manufacturers.	
Ames Chas. & Sons, Woodbridge, N. J.	18
Barrett & H. A. and Richmond, Phila.	18
Blakeworth F. W. 59 Chambers, N. Y.	23
Clark & Co., Buffalo, N. Y.	16
Cowles Hardware Co., Unionville, Ct.	30
Enterprise Mfg. Co., Phila.	3
Hart, Bliven & Mead Mfg. Co., 26 West, N. Y.	30
Middletown Tool Co., 18 & 20 Cliff, N. Y.	30
Huller & Fells Mfg. Co., 74 Chambers, N. Y.	21
Parr Geo., Buffalo, N. Y.	21
Patt & Co., Buffalo, N. Y.	21
Fuller, Dana & Co., 614 and 616 Market, Phila.	21
The Hall & Helden Co., Danbury, Conn.	16
Union Mfg. Co., 39 Chambers, N. Y.	7
Van Wagner & Williams, 82 Beekman, N. Y.	31
Wilson Mfg. Co., 72 Chambers, N. Y.	20
Hardware Specialties.	
Carver John, 28 Monroe, N. Y.	23
Felder Chas., 29 Thomas, N. Y.	23
Goodnow & Wightman, 28 Cornhill, Boston.	23
Grant & Co., Newark, N. J.	23
Kline, Briggs & Co., 108 Chambers, N. Y.	11
Jessup & Sterling, 7 and 9 Cliff, N. Y.	24
Langdon Mfg. Co., 108 Chambers, N. Y.	11
Sample, Birge & Co., St. Louis, Mo.	31
Shepard Sidney & Co., Buffalo, N. Y.	5
Spencer & Underhill, 41 Beekman, N. Y.	2
Hatchet, Makers of.	
Crane Bros. Mfg. Co., Chicago, Ill.	9
Otis Bros. & Co., 348 Broadway, N. Y.	9
Horse Nails, Makers of.	
Ames Chas. & Sons, Woodbridge, N. J.	18
Blakeworth F. W. 59 Chambers, N. Y.	23
Clark & Co., Buffalo, N. Y.	16
Cowles Hardware Co., Unionville, Ct.	30
Enterprise Mfg. Co., Philadelphia, Pa.	3
Hart, Bliven & Mead Mfg. Co., 26 West, N. Y.	30
Middletown Tool Co., 18 and 20 Cliff, N. Y.	30
Huller & Fells Mfg. Co., 74 Chambers, N. Y.	21
Parr Geo., Buffalo, N. Y.	21
Patt & Co., Buffalo, N. Y.	21
Fuller, Dana & Co., 614 and 616 Market, Phila.	21
The Hall & Helden Co., Danbury, Conn.	16
Union Mfg. Co., 39 Chambers, N. Y.	7
Van Wagner & Williams, 82 Beekman, N. Y.	31
Wilson Mfg. Co., 72 Chambers, N. Y.	20
Horse Shoes, Makers of.	
Boston Rolling Mills, 17 Battery, Boston.	4
Burden Iron Works, Troy, N. Y.	4
Rhode Island Horse Shoe Co., Providence, R. I.	7
Schoenberger & Co., Pittsburgh, Pa.	7
Hydraulic Jacks.	
Dudgeon Richard, 24 Columbia, N. Y.	32
Ice Chisels.	
Holder E. J. & Co., 54 Beekman, N. Y.	6
Ice Cream Freezers.	
Blanchard C. G., 58 Commerce, Phila.	6
Iron Bridges.	
Leitchon Bridge and Iron Works, Rochester, N. Y.	10
John Wm. W. 36 William, N. Y.	10
Iron Chimneys, Warm or Cold.	
John Wm. W. 36 William, N. Y.	10
Iron Commission Merchants.	
Brown T. Horne, 36 Wall, Phila.	10
Fuller, Dana & Co., 614 and 616 Market, Phila.	21
Spooner & Collins, St. Louis, Mo.	10
Iron, Pig, Importers of.	
Brumann James & Co., 69 Wall, N. Y.	10
Iron Pig Manufacturers of.	
Parrot Peter F., Greenwood Pct., Orange Co., N. Y.	10
Iron, Manufacturers of.	
Abel Brothers, 190 South, N. Y.	10
Bonelli, Botherford & Co., Yonkers, N. Y.	10
Clark & Co., 108 Chambers, N. Y.	11
Cleveland, Brown & Co., Cleveland, O.	10
Cooney Daniel F., 85 Washington, N. Y.	10
Fuller, Dana & Co., 120 Greenwich, N. Y.	10
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Fuller, Dana &	

B. KREISCHER & SON,
New York Fire Brick &
STATEN ISLAND
CLAY RETORT WORKS,

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Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand from my own mines at New Jersey and Staten Island by the car or otherwise.

Philadelphia Fire Brick
AND

Clay Retort Works,
AND KENSINGTON FIRE BRICK WORKS

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Successors to JOHN NEWKUMET, Proprietor.
Manufactures 9-inch Fire Bricks, Tiles, and Blocks for Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Glass Houses, &c., &c.
Articles of every description made to order at short notice, and in a very superior manner.

"CLAY RETORTS FOR SUGAR HOUSES."

National Fire Brick & Drain Pipe Wks.,
CHAS. ANNESS & SONS, Props.

Manufacturers of **FIRE BRICK** all shapes and sizes.
Miners and shippers of all kinds of **FIRE CLAY**.
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Manufacturers of all forms and sizes of **FIRE BRICK**, for Blast Furnaces, Rolling Mills, Gas Houses and Oven Tiles, and Stove Linings, made to order. Also Fire Clay, Kaolin, Sand and Fire Mortar.

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Established 1830. Manufacturers of
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In great variety, suitable for all parts of the world.

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Patent **CUTTER.**



For cutting circles or washers out of leather, rubber, paper or thin wood. It will cut any size up to 6 in. diameter, and can be used in an ordinary bit-stock.
Price \$2.00 per dozen.

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Manufactured by
Cranes Bros. Mfg. Co

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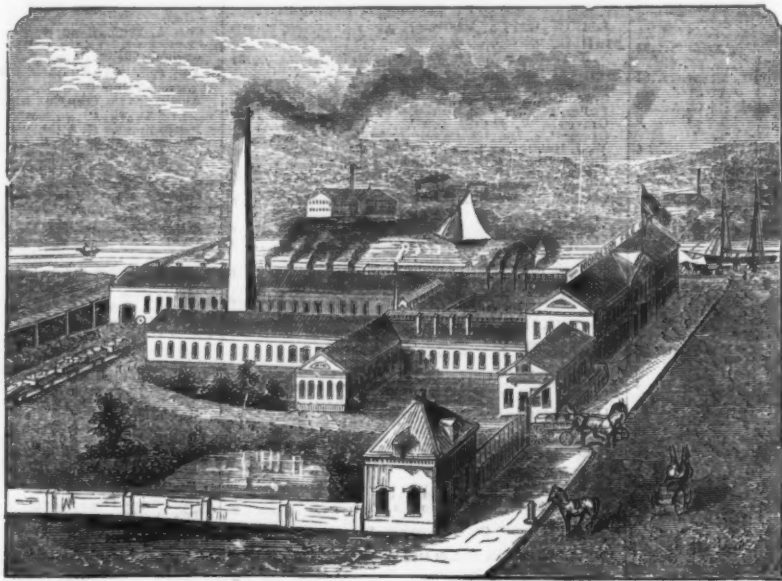
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WOODLAND FIRE BRICK CO.,
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Manufacture **SUPERIOR**
FIRE BRICK.

Especially adapted for Steel and Siemens Furnaces.
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FOR THE FOLLOWING REASONS:

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- Fourth.—They will finish finer than Files of any other make of same degree of coarseness.
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- Sixth.—The "Increment cut" File, by our records, will remove more stock with a given number of pounds applied than any other File with which we are acquainted.
- Seventh.—All Files under seven inches are put up in boxes of one dozen each, and neatly labeled.
- Eighth.—The large stock carried by us, combined with our superior facilities, enables us to fill the largest orders at the shortest possible notice.
- Ninth.—We are constantly making careful tests of our Files by delicately constructed machinery, which automatically records the actual power applied, forward, backward and downward, at each stroke of the File, also the number of strokes, combined with the work performed, enables us not only to judge of the quality of our Steel for wear, but also of the cutting qualities of the File, and the ease (expressed in pounds) with which a given amount of work can be accomplished.
- Finally.—Our Files are warranted to be hard, well cut and sound. They are exclusively used by many of the largest Railroads and Machinists in the country—and the vigorous growth of our reputation, not only for making a good article, but of our ability to furnish a good article cheap, is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

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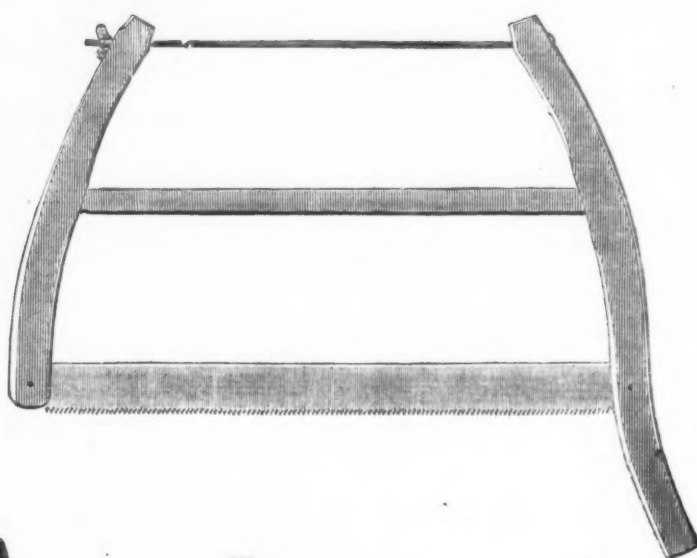
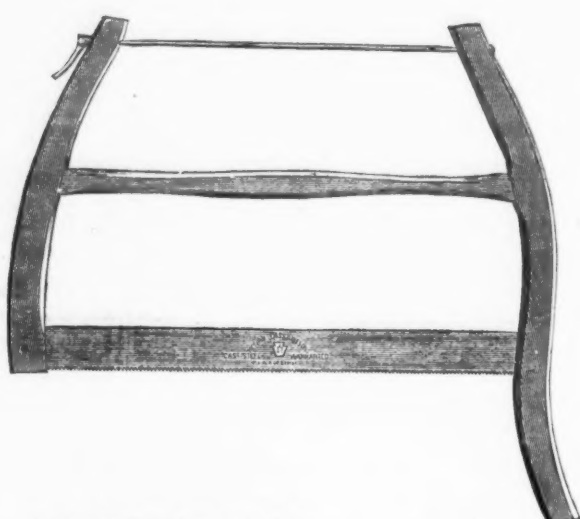
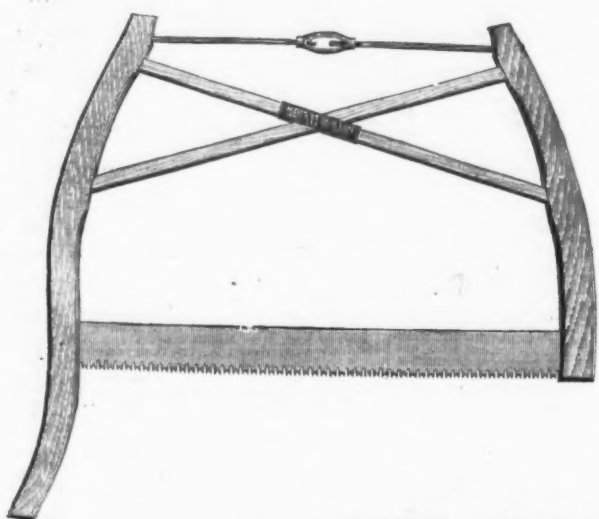
PATENTS and
TRADE MARKS.

Before the
Courts and Patent Office.

Keystone Saw, Tool, Steel and File Works,

Front and Laurel Streets, Philadelphia.

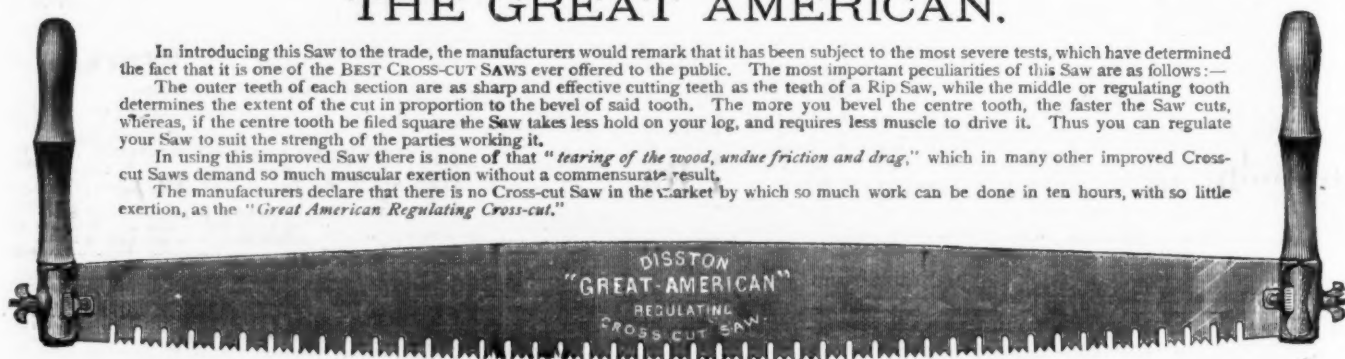
HENRY DISSTON & SONS, IMPROVED CROSS-CUT AND WOOD SAWS.



THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—
The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

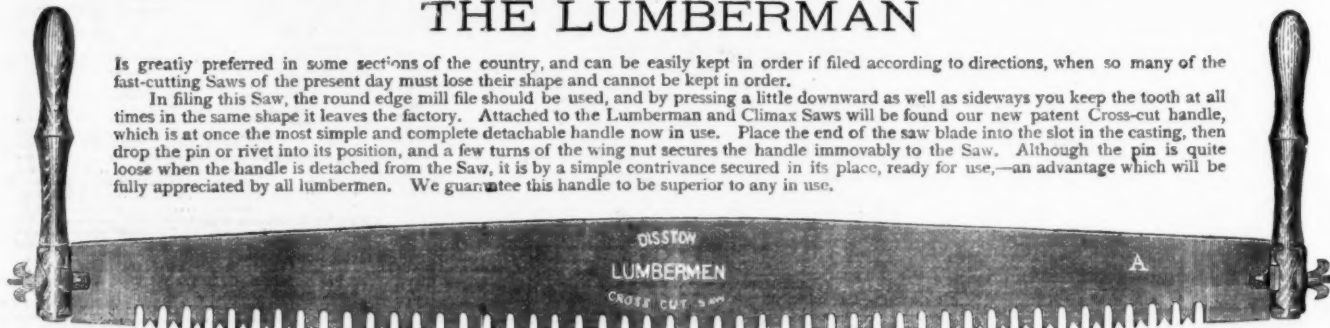
In using this improved Saw there is none of that "tearing of the wood, undue friction and drag," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "Great American Regulating Cross-cut."



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

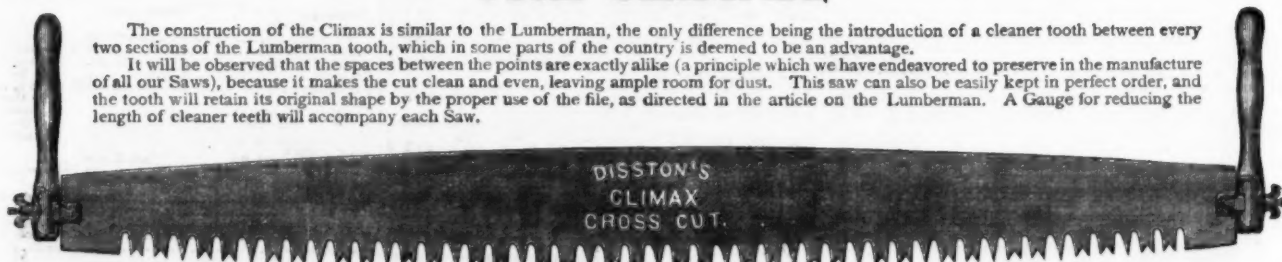
In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

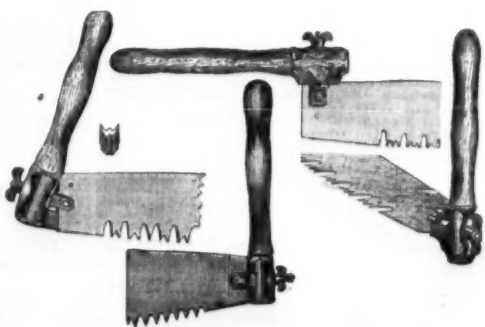
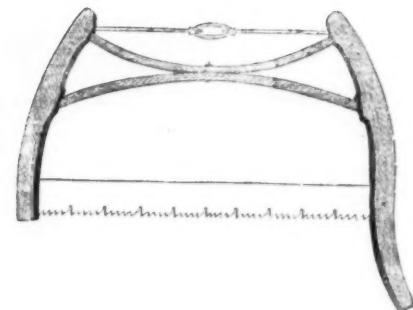
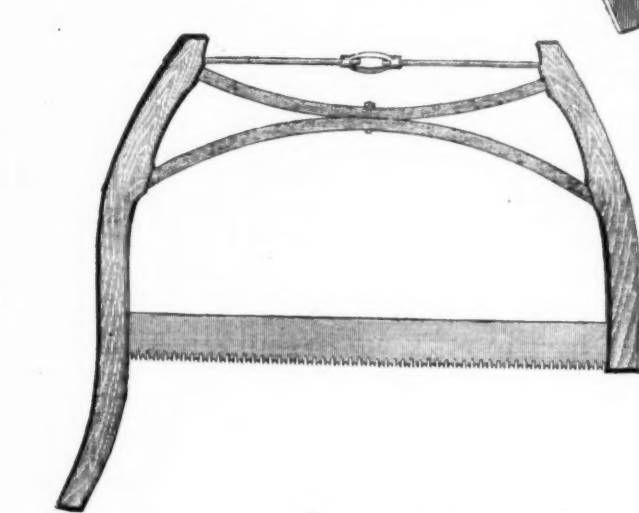
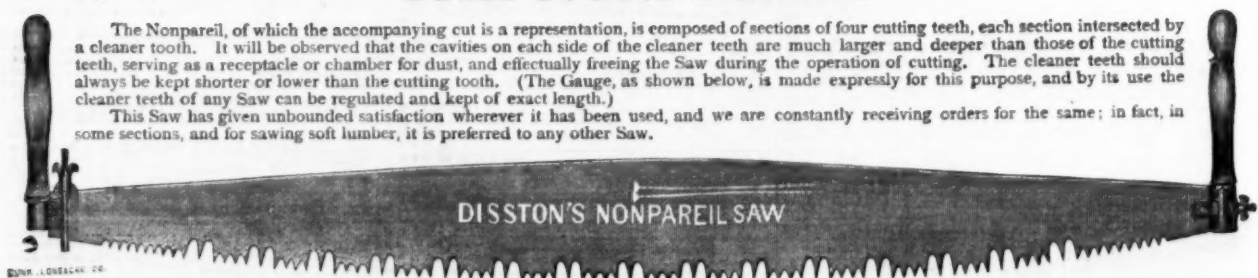
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



[illegible]

Plate	ZINC TUBING.	Res. Steel
-------	--------------	---------------

Copall, Copal, 35
Damar, 250
Gum Arabic, 550
Shellac, English, 500
" " dark, 500
Litharge, 900
Pumice Stone, selected Lump, 40
" " powdered, 16
Putty in bladders 3 1/2
" " to talk 3 1/2
Bottom Stone, soft, English, 10
Spirits Turpentine, 200
Whiting, Spanish, 100

Glass.

FRENCH WINDOW GLASS.

Prices current per box of 30 feet.

Single Thick.				
SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	\$ 7-50	\$ 6-75	\$ 6-25	\$ 5-75
11 x 14 to 16 x 24.....	8-50	7-75	7-25	6-75
18 x 22 to 20 x 30.....	10-75	9-75	8-75	7-75
15 x 38 to 21 x 50.....	12-25	10-75	9-00	8-00
26 x 28 to 24 x 36.....	13-00	11-50	9-75	
26 x 36 to 26 x 44.....	14-50	13-25	10-75	
26 x 46 to 30 x 50.....	15-00	14-00	11-25	
30 x 52 to 30 x 54.....	16-00	14-50	12-00	
30 x 54 to 38 x 60.....	17-25	15-50	13-50	
34 x 38 to 34 x 60.....	18-25	17-25	15-00	
36 x 50 to 40 x 60.....	20-75	18-75	17-25	

Double Thick.				
SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	\$12-00	\$10-00	\$10-00	\$ 9-25
11 x 14 to 16 x 24.....	13-75	12-50	11-75	10-50
18 x 22 to 20 x 30.....	17-25	15-75	14-00	
15 x 36 to 21 x 50.....	19-75	17-25	14-50	
26 x 28 to 24 x 36.....	21-00	18-50	15-75	
26 x 36 to 26 x 44.....	23-00	21-25	18-25	
26 x 46 to 30 x 50.....	24-00	22-50	19-00	
30 x 52 to 30 x 54.....	25-75	23-50	19-25	
30 x 54 to 38 x 60.....	27-25	25-00	21-75	
34 x 38 to 34 x 60.....	28-25	27-25	24-00	
36 x 50 to 40 x 60.....	30-25	30-00	27-25	

Sizes above 40 x 60—10 cts per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 34 inches length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.
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& CO..

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Not the CHEAPEST, but the BEST.

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GEARED FREEZERS.

No. 19.....	2 quart.
No. 20.....	4 "
No. 21.....	4 "
No. 22.....	6 "
No. 23.....	8 "
No. 24.....	10 "
No. 25.....	12 "
No. 26.....	16 "
No. 27.....	20 "

FLY WHEEL FREEZERS.

No. 28.....	16 quart.
No. 29.....	20 "

FRAME FREEZERS.

No. 33.....	20 quart.
No. 34.....	40 "

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No. 39.....	Two 20 quarts
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Award of the **MEDAL FOR MERIT** for their Exhibit
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This is the **ONLY** Award to any Exhibitor of
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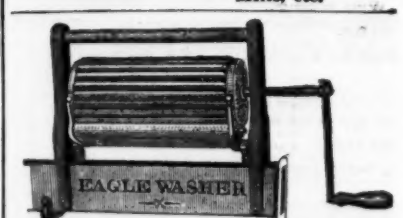
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EAGLE WASHER.It embodies several important new features, a ver-
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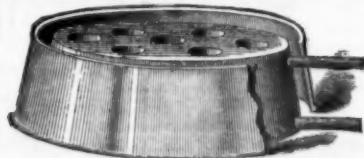
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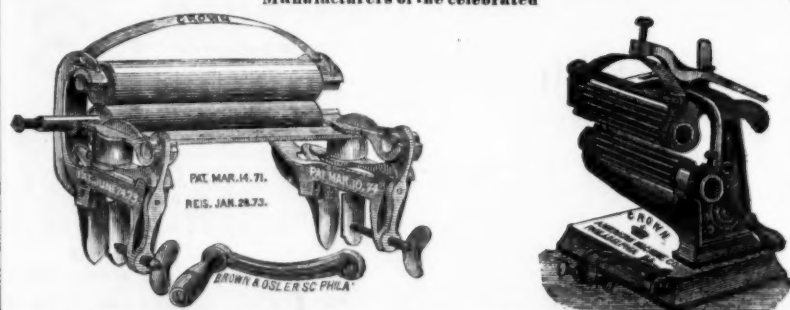
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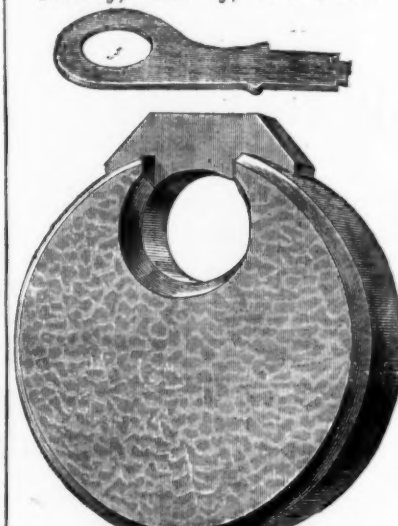
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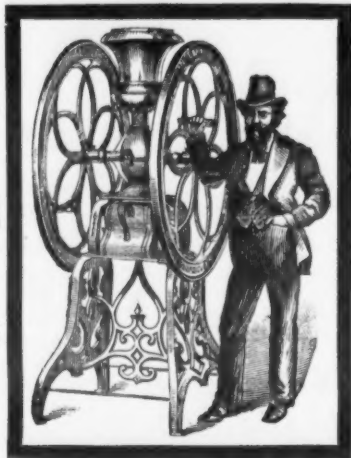
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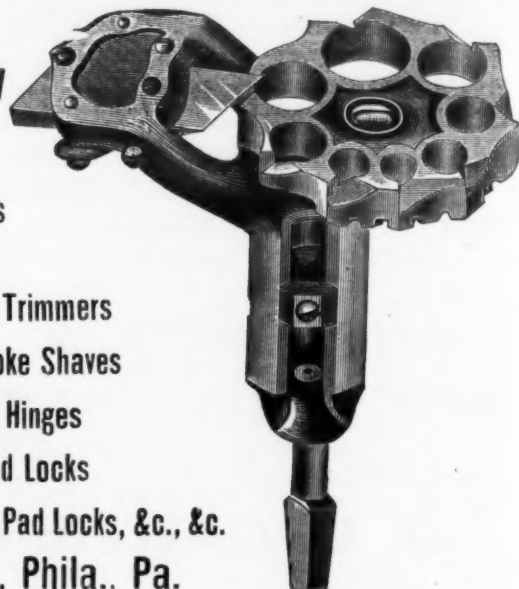
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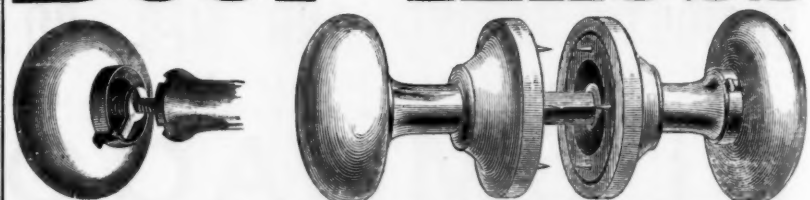
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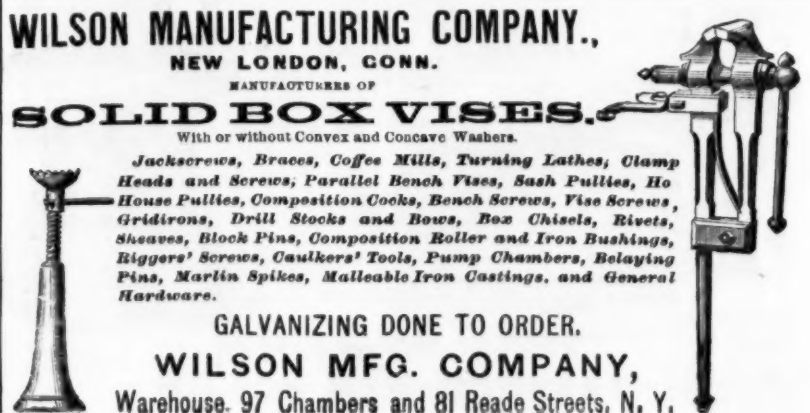
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Britannia, Boardman's (new list).....	dis 40c
Parkers (old list).....	dis 40c
German Silver.....	dis 40c
Light.....	dis 40c

Springs. —	
Spring-Gum Door.....	dis 40c
Torry's Door.....	dis 40c
Stocks and Dies. —	
Stove Polish—Gem.....	dis 40c
Only.....	dis 40c

Try Squares. —Winterbottom.....	dis 10c
Rate and Level Co.....	dis 10c
Willis Thrall, No. 2.....	dis 10c
Denton's No. 2.....	dis 10c

Tacks, &c. —Half Weight Tacks.....	dis 25c
Trunk, Clout and Finishing Nails.....	dis 25c
Traps.—Genuine Oneida—Sewhouse.....	dis 25c
Infant.....	dis 25c

Wires. —Solid Box, currency.....	dis 15c
Wires—Cores Genuine.....	dis 15c
Cores Imitation Wrought Bar.....	dis 15c
Malleable Bar.....	dis 15c
Kellogg's Malleable Bar.....	dis 15c

Wires. —No. 0 to 18.....	dis 15c
No. 19 to 24.....	dis 15c
No. 25 to 30.....	dis 15c
Coppered to 12.....	dis 15c
Tinned Broom Wire.....	dis 15c
Galvanized Wire No. 1 to 18.....	dis 15c

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
July 1st, 1876.

Augers—Snell Mfg. Co.	dis 25c
Acorn—Franch.....	dis 25c
Bits, Auger—Snell Mfg. Co.....	dis 25c
Phonix.....	dis 25c

Bells. —Cox & Sons' Genuine.....	dis 25c
Braces—Bil, Spoford's Patent.....	dis 25c
Brads, Cut.....	dis 25c
Brass—Sheets.....	dis 25c

Boards. —Stove, Brooker's Pat.....	dis 25c
Brick—Bath (box of 100) Best English.....	dis 25c
Can Openers—Squire's.....	dis 25c
Cases—Parlor Coal Hod.....	dis 25c

Chalk. —White, Carpenter's.....	dis 25c
Red, Carpenter's.....	dis 25c
Chisels—Finner Socket.....	dis 25c
Framing Socket.....	dis 25c

Chisels. —Finner Socket.....	dis 25c
Framing Socket.....	dis 25c
Corner Socket Chisel.....	dis 25c
Slick's Carpenters'.....	dis 25c

Castings. —Malleable.....	dis 25c
Corks—Globe and Bin.....	dis 25c
Cutters—Meat, "Hale".....	dis 25c
Egg Beaters—Dover.....	dis 25c

Elbows. —Corrugated.....	dis 25c
Files—Malchoss Bros.....	dis 25c
Flutes—Geneva Hand.....	dis 25c
Freezers, Ice Cream—"Champion".....	dis 25c

Hammers. —Henry W. Rip's.....	dis 25c
Hinges, Gate—Shepard's.....	dis 25c
Hinges—Window Blind.....	dis 25c
Shepard's and Standard.....	dis 25c

Hods. —Coal—Plain, Black and Galvanized.....	dis 25c
Fancy and Helmet.....	dis 25c
Kettles—Boiler.....	dis 25c
Copper, "Hand Made".....	dis 25c

Enamels. —	dis 25c
Knives—Drawing—Oral No. 1.....	dis 25c
Razor Blade.....	dis 25c
Lanterns, Tubular.....	dis 25c

Machines. —Apple Parer.....	dis 25c
Machines—Boring, Snell.....	dis 25c
Mills, Coffee—Box and Side, common.....	dis 25c
Box Union and Eagle.....	dis 25c

Cut Nails. —"Harrisburg," No. 1.....	dis 25c
Horse, Ausable.....	dis 25c
"Pointed & Polished," and 1c.....	dis 25c
1000 lbs.....	dis 25c

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Fans—Dripping.....	dis 25c
Frying.....	dis 25c

Plates. —Iron, Black and Tinned.....	dis 25c
Screws—"American Screw Co".....	dis 25c
Flat Head, Iron.....	dis 25c
Sliver—Wood, Hoop Iron.....	dis 25c

Sifters. —Ash.....	dis 25c
Skates and Straps—White's.....	dis 25c
Spoons, Iron Tinned.....	dis 25c
By the case.....	dis 25c

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Britannia.....	dis 25c
G. S. Hall, Eiton & Co.....	dis 25c
Seals—Buffalo Scale & W.....	dis 25c

Stove Polish. —Gem.....	dis 25c
Only.....	dis 25c
Squeezers—Lemon, Porcelain.....	dis 25c
Tacks—Half Weight Am. Iron.....	dis 25c

Tea Trays. —	dis 25c
Thermometers—Tin Case.....	dis 25c
Tools—Timmons.....	dis 25c
Vases—Palace Coal.....	dis 25c

Vices. —	dis 25c
Parallel, Buffalo, Old pattern, dis. 30c; new, do. 40c	
Ware—French, Tinned and Iron.....	dis 25c
Stained and Jammed.....	dis 25c

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Steel—Bessmer Steel.....	dis 25c
Wringers—Novelty.....	dis 25c
Tin Plates—Add for each.....	dis 25c

U. S. Gov't. —No. 1.....	dis 25c
12x12.....	dis 25c
12x12.....	dis 25c
12x12.....	dis 25c

Pig Tin—Stralts.	dis 25c
Bar Tin.....	dis 25c
Solder—No. 1, Crook's.....	dis 25c
No. 1 Star.....	dis 25c

Sheet Zinc. —	dis 25c
Lasalle.....	dis 25c
Sheets.....	dis 25c
Habbit Metal.....	dis 25c

Iron Wire. —Bright and Annealed.....	dis 25c
Coppered.....	dis 25c
Tinned.....	dis 25c
Tinned Broom, No. 20.....	dis 25c

Copper. —Sheathing 14 @ 18 oz.....	dis 25c
Plashed.....	dis 25c
Bottoms.....	dis 25c
Boils.....	dis 25c

Bruders' Sheets.	dis 25c
Common.....	dis 25c
24 Common.....	dis 25c
24 W. Wood & Co. Smooth Finish.....	dis 25c

Gen. Russia, No. 1 stained.	dis 25c
"clean".....	dis 25c
Galvanized.....	dis 25c

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(Reported by Messrs. Jettett & Root.)

Tin Plate. —Best Charcoal.....	dis 25c
IX, 10x14.....	dis 25c
IX, 10x14.....	dis 25c
IX, 10x14.....	dis 25c

IX, 12x12.	dis 25c
IX, 12x12.....	dis 25c
IX, 12x12.....	dis 25c
IX, 12x12.....	dis 25c

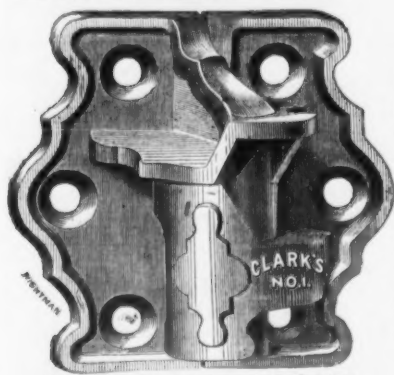
IX, 14x20.	dis 25c
IX, 14x20.....	dis 25c
IX, 14x20.....	dis 25c
IX, 14x20.....	dis 25c

IX, 14x20.	dis 25c
IX, 14x20.....	dis 25c
IX, 14x20.....	dis 25c
IX, 14x20.....	dis 25c

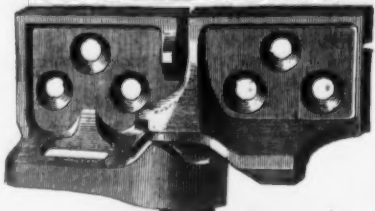
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MANUFACTURERS OF

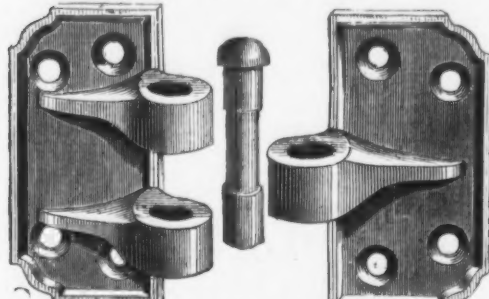
BUFFALO, N. Y.



Design Patented Jan. 11th, 1876.



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No. 1 Upper Gate Hinge.

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Guaranteed the best in Every Essential. Takes Less Room, Less Power, and costs Very much Less for Repairs than any other. Send for descriptive circular with names of over 200 using them—(to whom we refer.)

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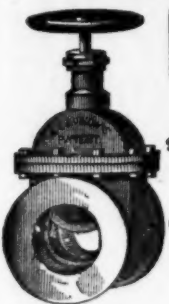
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(Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.)
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ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

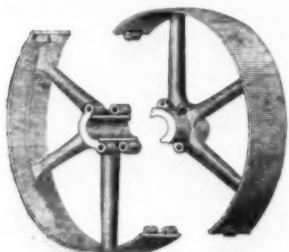
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Patented July 28, 1874.

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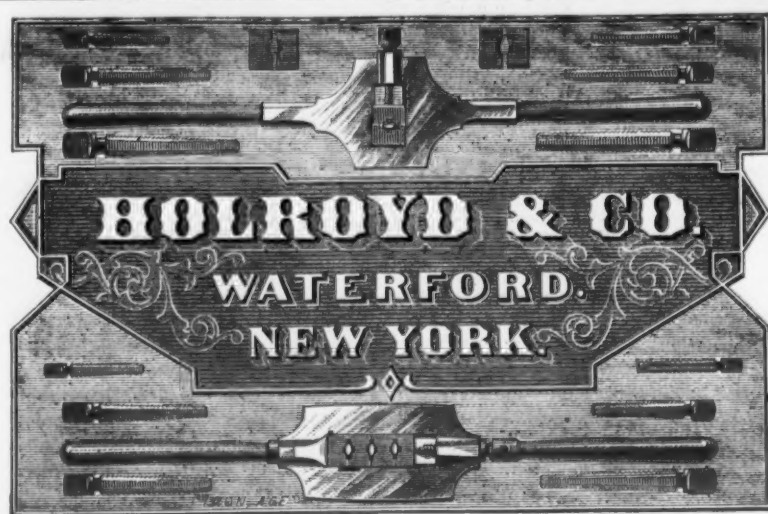
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Of same price, strength and appearance
as WHOLE PULLEYS and
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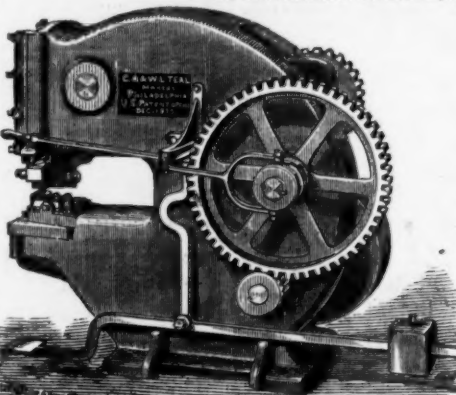
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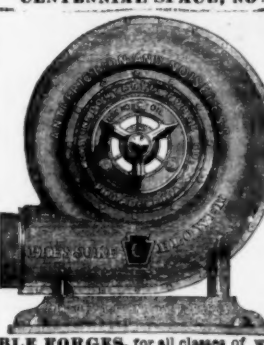
TEAL'S IMPROVED POWER PUNCH.

U. S. PATENT OFFICE, DEC. 1875.



The above represents our new pattern of Single Punch. The "head" is worked by a lever with jaws in the back end, which carry a Cam-gear with "treads," one on each side of the teeth; underneath the Cam and on the shaft of the large gear is a Pinion, with treads corresponding to those on the Cam; as the Pinion revolves, the Cam rolls round upon it, the shape (of the Cam) being such that about four-fifths of the circumference are employed in raising the lever and the remaining one-fifth in dropping it, giving the head a slow downward and a quick upward motion. The advantage of this will readily be seen, as the friction of the Cam is rolling friction, except that of the pin on which it revolves; the motion being like rolling up an inclined plane. The bearings for the lever in the punch-head are provided with an arrangement for taking up the wear or lost motion, which avoids the necessity of repairing. The die-seat is capable of very accurate adjustment with this punch; and for boiler makers the machine is made small at the end on which the die-seat rests, for punching flanged heads, angle iron, &c. Punch Strips are also adjustable to any thickness of iron.

These machines are provided with a loose and heavy fast pulley, and are made separate for punching, shearing plate and cutting off bar iron; and when desired, one machine can be furnished with attachments for all three purposes. Our regular pattern for Boiler Makers will punch 1 in. hole in 1 in. iron, shear 1 in. plate and cut off 1 1/2 in. bar iron, and will punch and shear in the center of 4 in. and 6 in. plate. Machines made to order for any kind of work, from the lightest to the heaviest.

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CENTENNIAL SPACE, NO. 5037, SECTION C. 3. MACHINERY HALL.

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Anti-friction and noiseless; maximum blast and minimum power;
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PRESSES, DIES, & SPECIAL MACHINES,
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USE THE BEST.

THE BEST IS ALWAYS
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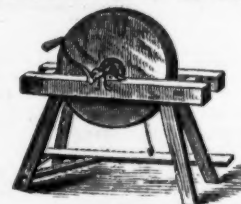
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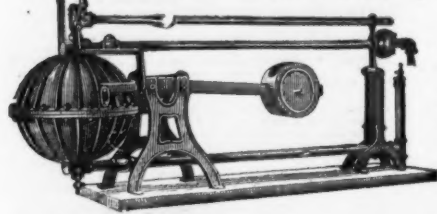
Improved Steam Governor.

No Charge for Boxing & Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

Size, Inch.	Plain.	Bright Finish.	Extra for Lever.	Stop Valve.
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2	21.00	24.00	2.00	85.00
2 1/2	25.00	28.00	2.25	6.00
3	29.00	33.00	2.50	8.00
3 1/2	35.00	40.00	2.75	10.00
4	42.00	48.00	3.25	14.00
4 1/2	45.00	51.00	3.50	15.00
5	49.00	56.00	3.75	17.00
5 1/2	55.00	63.00	4.25	20.00
6	64.00	73.00	4.50	25.00
6 1/2	74.00	84.00	5.00	30.00
7	86.00	97.00	5.50	36.00
8	94.00	106.00	6.00	42.00
9	112.00	125.00	6.50	48.00
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12	150.00	165.00	8.00	68.00
14	185.00	202.00	9.00	80.00
16	305.00	325.00	10.00	..

The Albany Steam Trap.



This Trap automatically drains the water of condensation from Heating Coils, and returns the same to the Boiler whether the Coils are above or below the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

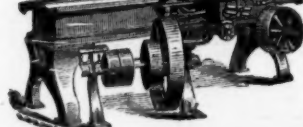
Albany Steam Trap Company,
Albany, N. Y.

The Pratt & Whitney Co.,

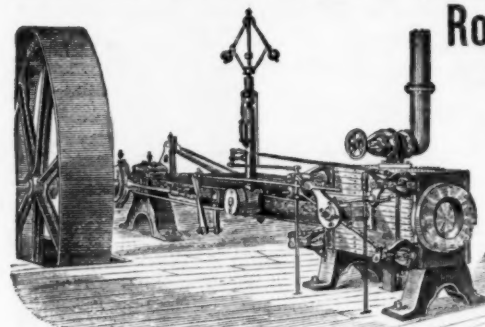
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Shafting & Gearing,
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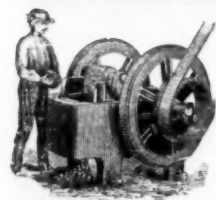
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PORTABLE DRILLS. Driven by power in any direction.
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.
VERTICAL DRILLS. Self-feeding.
MULTIPLE DRILLS. 2 to 20 Spindles.
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HAND DRILLS. CAR BOX DRILLS.
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New Pattern with Important Improvements & Abundant Strength

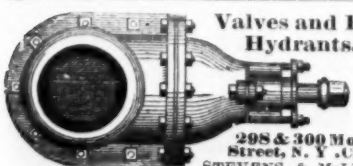


For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect MACADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

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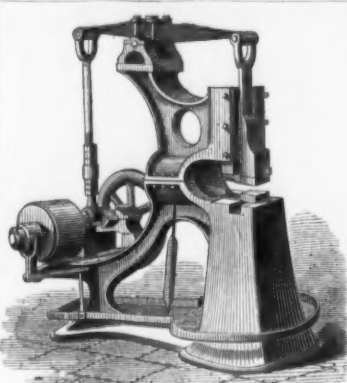


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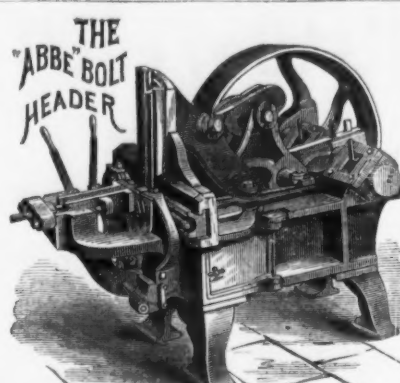
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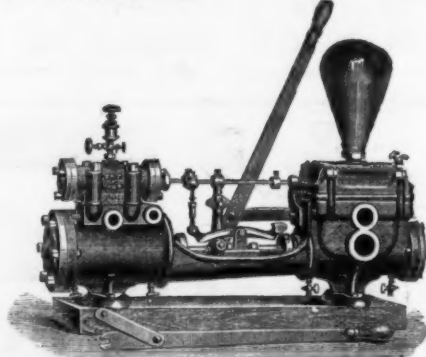
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Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

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Mining Pumps (both Double Acting Plunger, and Piston Pattern), which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.



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Punching Presses.

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I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

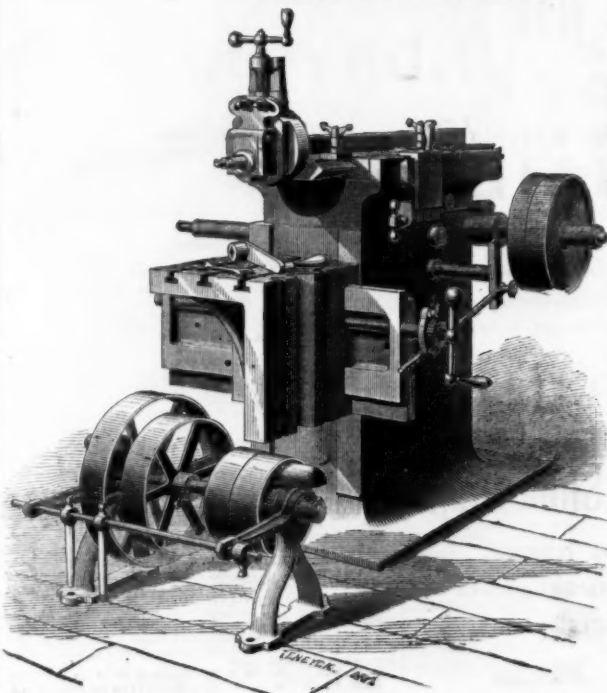
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Machinery Hall, Philadelphia, Section B 4, Columns 28 and 29.

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WOLCOTTVILLE, CONN.

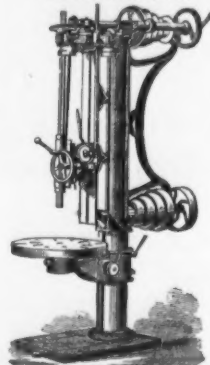


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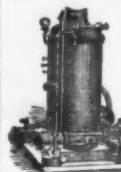
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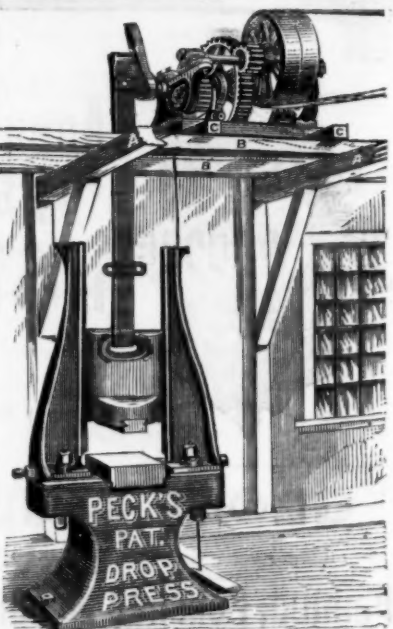
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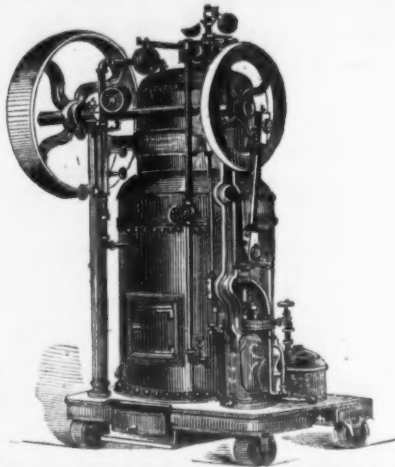
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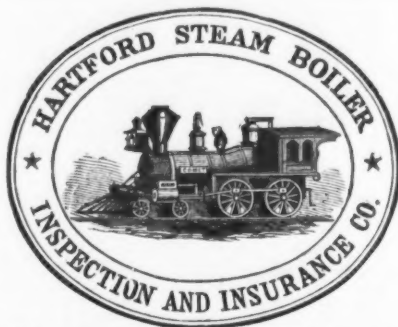
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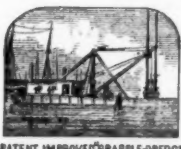
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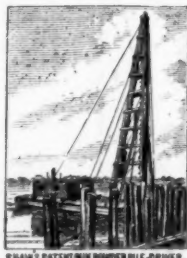
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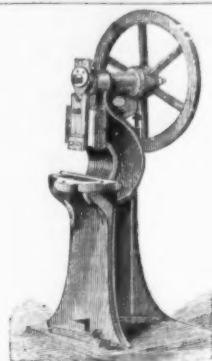
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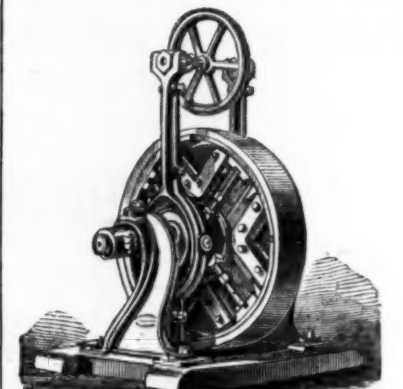
REPORT OF JUDGES

In Department V, Group 3, at the 44th
Exhibition of theAMERICAN INSTITUTE,
Held in the City of New York, Oct., 1875.No. 318, Drawing, Drop &
Punching Presses.THE STILES & PARKER PRESS CO.,
Of Middletown, Conn.The machinery exhibited by these makers is of a
character that calls for special commendation. In
addition to their well known punching presses, to
which a new feature has been added in a press ad-
justable to an inclination for discharging work left
above the die, there are exhibited by them a com-
bined punch and shears, a drawing or blanking press,
and a drop.In all these there is shown the highest mechanical
culture, applied to meet every practical requirement,
to avoid every practical difficulty, and to enlarge the
range of application of the machines, by devices
which are at once simple, elegant, and effective.
Your committee would unhesitatingly recommend
for this exhibition the "Medal of Progress," but
find such award debarred by the rule of the Institute,
forbidding such award unless a Silver Medal has
been previously awarded. We, therefore, respect-
fully recommend the award of a Silver Medal.Silver Medal Awarded.
A true copy from the Report on file.

JOHN W. CHAMBERS, Sec'y.

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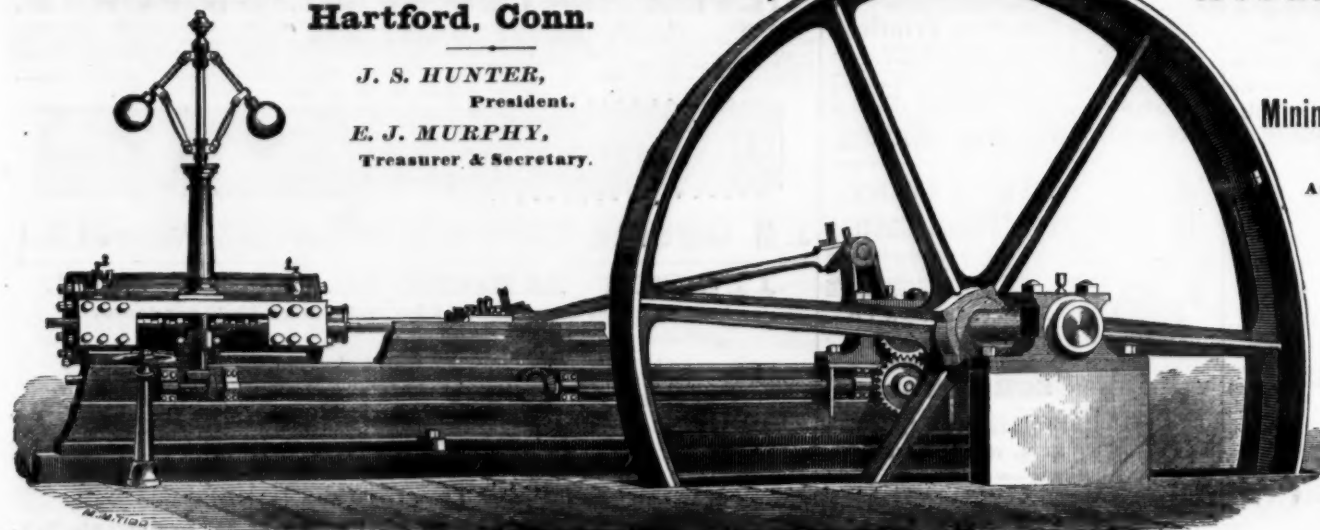
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